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16. Abstract

Young people, in particular young males, are overrepresented in fatal crashes. In part, this elevated fatal crash rate results from the lack of seatbelt use among teen drivers and passengers. A recent review of more than 200 teen-targeted programs for promoting belt use found that few were effective and none were empirically based on an understanding of the cognitive processes underlying the decision for a teen to use or not use a seatbelt. Seatbelt use researchers face a daunting challenge: How can we explain and influence the behavior of part-time seatbelt users? Our approach to this challenge rested on the assumption that a driver's seatbelt use—or nonuse—is at least partly a product of the driver's decisions. A "decision" is *a commitment to a course of action that is intended to serve the interests and values of particular people*, sometimes called the *intended beneficiaries*. In this study, we distinguish two levels of seatbelt use decisions: policy and spot. A driver's seatbelt use "policy" is a rule the driver says that he seeks to follow in determining whether to use his seatbelt on a given trip. In the present research, a "spot decision" is a driver's decision about whether to use a seatbelt on a given trip—literally on the spot. The theory guiding this work was the "cardinal issue perspective" (CIP) on decision making. According to the CIP, 10 issues arise in every decision situation, in some form or another. Further, each of those issues is resolved somehow by the decision maker, deliberately or not. The study involved the recruitment of 24young male drivers. Each participant drove an instrumented vehicle, equipped with several sensors including a camera that began recording in-cabin behavior when the vehicle door opened, for 12 days. After review of the driving and belt use data by research staff, participants completed a detailed interview of their belt use policies and spot belt use decisions. The results showed that belt use varied as a function of the presence of a passenger, time of day, and trip length. About one-half of participants had policies regarding belt use. Of those who did report having policies, one-half had a policy to always use belts and the rest had part-time belt use policies. The details of the part-time policies varied widely among participants. Issues influencing spot decisions included forgetfulness, distraction, short trip lengths, and familiarity with the road network to be traveled. One factor influencing belt use decisions that clearly emerged from the study was habit. Many participants with a full-time belt use policy reported that their use of belts was simply a habit. Efforts on the behalf of driver educators and parents to instill the habit of belt use in young people will free young drivers from the necessity of having to make belt use decisions on a trip-by-trip basis. Although one benefit of having a full-time seatbelt use policy is that it frees individuals from having to expend the effort to make a belt decision on every trip, most participants in our study seemed to be unaware of the investment costs associated with such trip-by-trip decisions. Other conclusions are presented.

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INTRODUCTION

The National Highway Traffic Safety Administration (NHTSA, 2010a) estimates that about 34,000 people died in traffic crashes in the United States (US) in 2009. Young people, in particular, are overrepresented in these crashes. According to NHTSA (2010b), more than one-third of teen deaths were related to motor vehicle crashes. Based on both the number of licensed drivers and miles driven, teen drivers have higher fatal crash rates than all other age groups (Compton & Ellison-Potter, 2008). In part, this elevated fatal crash rate results from the lack of seatbelt use among teen drivers and passengers. Of those teen drivers and passengers killed in 2006, fewer than 40 percent were using seatbelts at the time of the crash (NHTSA, 2010b).

Seatbelt use is the most effective way to reduce the severity of injury resulting from a motor vehicle crash. Indeed, the use of lap and shoulder belts has been shown to reduce the risk of fatal injury to front-seat passenger car occupants by 45 percent and reduce the risk of moderate-to-critical injuries by 50 percent (NHTSA, 1996). Despite these clear benefits of seatbelt use, teens, in particular teen males, use belts less often than any other age group. A recent literature review concluded that teens use belts only about 50-60 percent of the time (Fell et al., 2005).

Significant resources have been expended in the past 2 decades to develop effective programs and policies for increasing belt use among teens. For example, Fell et al. (2005) reviewed published documents on more than 200 programs either targeted directly at teen belt use or at teen risky driving behavior in general. The researchers found that only a small percentage of these programs showed evidence of effectiveness. Of these, most utilized increased police enforcement, incentives for using belts, education, or some combination of these methods. None of the programs reviewed by Fell et al. (2005) were empirically based on an understanding of the cognitive processes underlying the decision for a teen to use or not use a seatbelt.

Seatbelt Use Decision Making

Seatbelt use researchers face a daunting challenge: How can we explain and influence the behavior of part-time seatbelt users? Our approach to this challenge rested on the assumption that a driver's seatbelt use—or nonuse—is at least partly a product of the driver's decisions. Suppose that we understand the mechanisms whereby the driver arrives at those decisions. Further, suppose that we have the means to influence the mechanisms revealed. Then we have a new set of tools for encouraging drivers to make "better" decisions; ones that result in higher rates of seatbelt use. Thus, the purpose of this study was to initiate a program of research that ultimately should yield fully validated depictions of how significant segments of the population of part-time seatbelt users arrive at their seatbelt use decisions. We highlight "segments" because, in anticipation of the ultimate findings of this research program, there is reason to expect wide individual variations in the specifics of how these decisions are made. We say "initiate a program" because at this point in our research, the aim is productive structured exploration. That is, our purpose was to gather suggestions of plausible high-impact aspects of decision mechanisms that might have been neglected in previous research. Later studies would directly and empirically test for the actual existence and frequency of the mechanisms in question.

Levels of Decisions: Policy vs. Spot

A "decision" is *a commitment to a course of action that is intended to serve the interests and values of particular people*, sometimes called the *intended beneficiaries* (cf. Yates, 2003, p. 24). In a seatbelt use decision, we should certainly expect the driver himself to be one such intended beneficiary. But it would not be surprising to discover that some drivers see as their

intended beneficiaries numerous others, such as their families. We distinguish two levels of seatbelt use decisions: policy and spot. Here we describe the distinctions between these types as well as their connections.

A driver's seatbelt use "policy" is a rule the driver says that he seeks to follow in determining whether to use his seatbelt on a given trip. More generally, a "decision rule" is a rule of the following sort: *If Conditions C1, C2, … hold, then take Action A*. Thus, perhaps the simplest plausible seatbelt use rules would be something like "Never use a seatbelt" or "Always use a seatbelt." A more complicated rule would be illustrated by, say: "Use a seatbelt when driving above 40 miles per hour." In the present research, a "policy decision" was defined as a decision to adopt a particular seatbelt-use policy or decision rule. In common decision theory parlance, such a policy decision is called a "meta-decision," a decision about deciding.

In the present research, a "spot decision" is a driver's decision about whether to use a seatbelt on a given trip—literally on the spot. Suppose that a driver has made a prior policy decision that says, "Always use a seatbelt." Then one might expect that the driver indeed would always use a seatbelt. But this is not necessarily so. Forces may exist that override that policy, leading the driver to make a contrary decision at the moment.

The fact that we can conceptually distinguish policy and spot seatbelt decisions implies that, in order to get closer to a complete understanding of how drivers end up either using or not using their seatbelts on given occasions, we need to examine both decision varieties. And that was the broad aim of the present project.

A Conceptual Theory of Decision Making: The "Cardinal Issue Perspective"

The conceptual theory guiding our work is the "cardinal issue perspective" (CIP) on decision making (Yates, 2003; Yates & Tschirhart, 2006). Figure 1 provides a schematic depiction of that perspective. According to the CIP, each of 10 issues arises in every decision situation, in some form or another. Further, each of those issues is resolved somehow by the decision maker, deliberately or not. Thus, within the CIP, "decision processes" are conceptualized broadly as the means by which the decision maker resolves the various issues in the decision situation at hand.

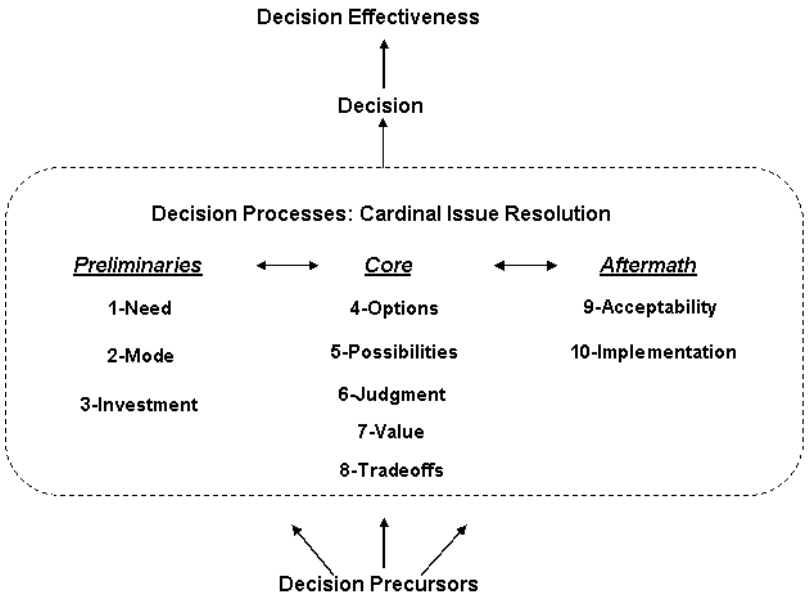

Figure 1: Decision Processes

It is implicit in the top portion of Figure 1 that the effectiveness of a decision derives from how well each cardinal decision issue was resolved in the process by which the decision was made. Indeed, one attractive feature of the CIP is that there is valid, published empirical evidence that mishandling each of the cardinal issues can significantly compromise decision effectiveness. Another is that the entire collection of cardinal issues is as comprehensive as it is. Thus, if one has assurances that the decision maker addresses every issue well, there is good reason to expect that the resulting decision will be an effective one.

What is decision effectiveness? The concept entails two broad classes of occurrences. First are "outcomes per se." These are consequences for the intended beneficiaries that are produced by the action taken as a result of the decision. Catastrophic injury from a crash in which a driver chose to forgo using a seatbelt would be one example. Peace of mind from using a seatbelt would be another. However, aggravation associated with trying to keep the belt from mussing one's clothes would be an example as well. Then there are "process costs and benefits." These apply to the decision maker as a decision beneficiary. (Bear in mind that decision makers are invariably among the intended beneficiaries of virtually any decision.) Process costs and benefits are experienced regardless of the action the decision maker selects and pursues. They instead derive from the activities of the decision maker when deliberating the decision problem in question. Some of these costs and benefits are "material," such as the time spent pondering the decision problem. Others are "psychological," such as the anxiety drivers might feel when considering the prospect of death or the generalizable learning about safety their deliberations can produce.

The heart of the CIP is the middle portion. There, Figure 1 indicates that within the CIP, "decision processes" are conceptualized as the decision maker's means of resolving each of the cardinal decision issues as it presents itself in the decision situation at hand. It is convenient to recognize that the cardinal issues fall into three categories that correspond roughly to when they are encountered in a given decision episode. This is despite the fact that, as suggested by the double-pointed arrows, the various issues can be (and typically are) revisited several times over the course of the decision maker's deliberations. As indicated in the diagram, the first three issues are said to occur in the "Preliminaries" of a decision episode. That is, although the resolution of those issues is essential to making a decision, the issues in the Preliminaries are mainly about setting the stage for what most people normally think of as making a given decision per se. Concluding that there is a decision to make in the first place is a good example of a "Preliminaries" activity. In contrast, the issues in the "Core" concern activities that more immediately and directly bear on determining which action the decision maker ultimately pursues, e.g., using a seatbelt or not. Finally, the issues in the "Aftermath" concern events that normally occur after the decision maker has selected a particular course of action, such as actually implementing that intended action, or not. As we will argue, however, in arguably wise decision making practices, such events should be anticipated and weighed before the selection of a course of action is finalized back in the "Core."

At heart, the present project entailed an extensive and intensive ethnographic type of examination of how a pool of self-described part-time seatbelt users made actual seatbelt use decisions, of both the policy and spot varieties. As indicated, this reduces to determining and appraising how drivers addressed every cardinal issue. Thus, it is useful to convey a clear sense of what each such issue involves. Table 1 is intended to provide such an understanding. The first column in Table 1 lists the names of the various cardinal decision issues. The second articulates the gist of each issue, in the voice of the decision maker for a generic, unspecified decision problem. The last two columns describe the kinds of things the decision maker must accomplish in order to address each issue in question. To make things concrete for present purposes, these tasks are expressed in the voice of a part-time seatbelt user confronted with a

seatbelt use policy decision in the third column and a seatbelt use spot decision in the last column.

Table 1: Cardinal Decision Issues, Generically and for the Driver as a Seatbelt Policy or Spot Decision Maker			
Issue	**In the Decision Maker's Voice—Generically**	**The Driver's Mission—In His Voice As A Seatbelt Use Decision Maker**	
		Policy Decision	**Spot Decision**
1—Need	*"What, if anything, is about to happen that merits a decision on my part?"*	*"Determine what is about to happen that merits making a decision about me adopting a personal seatbelt use policy."*	*"Determine what is about to happen that merits making a decision about whether to use my seatbelt on this trip."*
2—Mode	*"What particular ways of deciding—decision modes—should I apply in this situation? Specifically, which people (or devices) should I seek to have working on this decision problem? What roles should they play, and what approaches should they adopt?"*	*"Identify suitable people (or devices) and methods to assign to the specific tasks required to make a sound decision about whether I should have a seatbelt policy and, if so, what that policy should be."*	*"Identify suitable people (or devices) and methods to assign to the specific tasks required to make a sound decision about using my seatbelt on this trip."*
3—Investment	*"In order to make this decision well enough, what can and must I spend on the process, and on what, exactly?"*	*"Determine the resources—material and otherwise—required to support the people (or devices) and methods needed to make an adequate decision about whether to adopt a potential seatbelt policy for myself. Then secure and apply those resources, but no more than that."*	*"Determine the resources—material and otherwise—required to support the people (or devices) and methods needed to make an adequate decision about whether I should use my seatbelt on this trip. Then secure and apply those resources, but no more than that."*
4—Options	*"What are reasonable alternative actions I should consider as potential solutions to this decision problem I have?"*	*"Assemble a collection of alternatives that include at least one suitable solution to my seatbelt policy decision problem. At the same time, though, constrain the number and character of those alternatives so as to minimize my deliberation costs and mistakes."*	*"Assemble a collection of alternatives that include at least one suitable solution to my dilemma about whether to use my seatbelt on this trip. At the same time, though, constrain the number and character of those alternatives so as to minimize my deliberation costs and mistakes."*
5—Possibilities	*"Suppose I were to pursue this course of action. What obvious and especially non-obvious events could occur which, in combination with this action, would result in consequences that are significant for key parties?"*	*"Bring to the surface obvious and especially non-obvious potential occurrences which, if they actually happened, would matter greatly to relevant people, perhaps depending on whether I adopt a particular seatbelt use policy, or none at all."*	*"Bring to the surface obvious and especially non-obvious potential occurrences which, if they actually happened, would matter greatly to relevant people, perhaps depending on whether or not I wear my seatbelt on this trip."*

Table 1, continued: Cardinal Decision Issues, Generically and for the Driver as a Seatbelt Policy or Spot Decision Maker			
Issue	**In the Decision Maker's Voice—Generically**	**The Driver's Mission—In His Voice As A Seatbelt Use Decision Maker**	
		Policy Decision	**Spot Decision**
6—Judgment	*"If this event actually happens, then the action I have chosen would be really good for the people of concern here, including perhaps me. But* would *it happen? What are the chances?"*	*"Generate or otherwise acquire accurate and inexpensive judgments for the various occurrences that matter to the wisdom of me adopting a personal seatbelt use policy and perhaps which one."*	*"Generate or otherwise acquire accurate and inexpensive judgments for the various occurrences that matter to the wisdom of me wearing or not wearing my seatbelt on this trip."*
7—Value	*"Would they (and even I) like or dislike this if it actually happened? How much?"*	*"Make accurate judgments of how key people (including perhaps me) would feel about potential outcomes and other facts surrounding my eventual decision about adopting a personal seatbelt use policy."*	*"Make accurate judgments of how key people (including perhaps me) would feel about potential outcomes and other facts surrounding my eventual decision to either use or not use my seatbelt on this trip."*
8—Tradeoffs	*"Every one of my options has drawbacks as well as advantages relative to its competitors. So which of those courses of action should receive my commitment, which should I pursue?"*	*"Determine whether or not I should commit to adopting a particular seatbelt-use policy, despite the drawbacks of doing that."*	*"Determine whether or not I should commit to either using or not using my seatbelt on this trip (and perhaps in a particular way), despite the drawbacks of doing that."*
9—Acceptability	*"How can I cope with or, ideally, preclude negative reactions to my decision—and how I made it—by key people, particularly those who matter a great deal?"*	*"Make it unlikely that the personal seatbelt policy decision I eventually make will be resisted or sabotaged by key people because they object to what I decided to do and/or how I arrived at that decision."*	*"Make it unlikely that my eventual decision to either use or not use my seatbelt on this trip will be resisted or sabotaged by key people because they object to what I decided to do and/or how I arrived at that decision."*
10—Implementation	*"I decided to pursue Action A. Now, how can I get it done—assuming that I* can *get it done?"*	*"Make certain that my eventual decision about whether to adopt a particular seatbelt-use policy actually will be implemented as I intended."*	*"Make certain that my eventual decision about whether to use my seatbelt on this trip actually will be implemented as I intended."*

Considering Figure 1 again, notice that the bottom of the display cites "Decision Precursors." These encompass the myriad conditions and events that determine how the decision maker addresses the various cardinal issues. Some of these precursors are beyond anything an outside person, such as a driving instructor, family member, or police officer, can influence. A driver's inborn temperament might be an example. Other precursors, however, should indeed be susceptible to such influence, depending on the cardinal issue in question. Eventually, building on the present effort, it should be possible to identify influence-susceptible cardinal issues and

then design effective means of exerting such influence to increase the incidence of "positive" seatbelt use decisions.

The specific aims of the project were to: 1) observe part-time seatbelt use in a naturalistic setting, within the context of broader driving behaviors; and 2) to better understand the decision making processes underlying the use and nonuse of seatbelts, based on these 'contextual cues.'

The project aims were achieved through several main tasks including: recruiting participants; collecting driving data through in-vehicle technology installed in research vehicles driven by each participant for 12 days; downloading and processing the in-vehicle technology data to better understand the driving contexts in which use and non-use of seatbelts occur (referred to as 'contextual cues'); and conducting structured interviews with participants to explore the various decision processes that led to their belt use or non-use, based on the 'contextual cues' derived from the driving data.

METHODOLOGY

Participant Recruitment

The project was designed around the recruitment of 24 young male drivers, who by self-report, did not always use their seatbelt when driving (referred to as 'part-time' seatbelt users). Project participants were initially recruited through flyers circulated on two college campuses in Washtenaw County – Washtenaw Community College and Eastern Michigan University. Both of these colleges are considered commuter campuses and are therefore likely to have a higher proportion of young people in the desired age group who drive regularly than other non-commuter campuses such as the University of Michigan. Due to limited response to the flyers, recruitment sites for posting the flyers were expanded to other public sites in Washtenaw Country frequented by the target population (e.g., coffee shops, restaurants/fast food establishments, sports venues).

Interested individuals who called the University of Michigan in response to the flyers were screened for eligibility by a member of the project team. Inclusion criteria for project participation included: being male, age 18-24, and a part-time seatbelt user by self-report; having a valid Michigan driver license; reporting having driven for at least 2 years and currently driving at least 5 days per week; and reporting being capable of driving a car equipped with an automatic transmission without assistive devices or special equipment. However, they were not aware that their seatbelt use was the primary focus of the study.

Individuals were excluded from participating in the project if they refused to grant us permission to review their publicly available driving record, or if they had been convicted of any of the following driving violations in the past 24 months: driving while their operator's license is suspended, revoked, or denied; vehicular manslaughter, negligent homicide, felonious driving or felony with a vehicle; operating a vehicle while impaired, under the influence of alcohol or illegal drugs, or refusing a sobriety test; failure to stop or identify under a crash (includes leaving the scene of a crash, hit and run, giving false information to an officer); eluding or attempting to elude a law enforcement officer; traffic violation resulting in death or serious injury; any other significant violation warranting suspension of license.

Individuals who passed the initial telephone screening were asked for their permission for us to review their publicly available driving record to confirm their self-reported driver history information, along with their driver license number so that we could pull the right record. UMTRI serves as the repository for the Michigan Secretary of State's driving history records and has been granted authorization by the state to examine any individual's record who has given us permission to do so, as part of our research efforts. Therefore, we were able to pull the driving record of a potential project participant within a short time after conducting the telephone screening and make a final determination of whether he was eligible to participate.

Individuals deemed eligible for project participation, based on review of their driving records, were contacted via telephone and scheduled to come to UMTRI to begin their project participation. Participants were paid $80 for their time; half of that amount ($40) was paid when they returned the research vehicle at the end of the 12-day period of driving and the remaining $40 was paid after they had completed the structured interview approximately 1 week later. While 24 participants were recruited and drove the research vehicle for the required 12 days, only 22 of those returned to UMTRI to complete the structured interview, despite several attempts to contact them to schedule the interview. Thus, the study had 22 participants with complete data.

Eligible drivers who agreed to participate in the project came to UMTRI on their scheduled date/time to pick up the research vehicle they would be using in the project. Before beginning their formal project participation, a member of the research team checked to make

sure participants had a valid Michigan driver license and had them complete a comprehensive informed consent for the project. Participants were also asked to complete a short demographic questionnaire. Participants were provided with the research vehicle and given an overview of its basic driving features/operations. They were instructed to use it as their personal vehicle and drive as they normally would for approximately 12 days. Before they left UMTRI, a return visit was scheduled for them to bring back the research vehicle. Participants were told that they would be contacted by a member of the research team in about 1 week to make sure that the vehicle was functioning properly.

Before being released to a participant, vehicles went through a series of checks and preparations. This included a mechanical inspection, an extensive data review, and setup of data acquisition systems. All issues were resolved before release, and vehicles were also cleaned and fueled between participants. As much as possible, vehicles were scheduled to be returned early in the week and released late in the week to allow adequate time for return processing, inspections, and preparation for release.

The average age of the 22 participants was 21 years with ages ranging from 18-24 years. All participants were single and had never been married. The highest level of education, race, and annual income of participants is shown in Table 2. As can be seen, most of the participants were college students, with a low annual income. All but two participants were either White or Black.

Table 2: Self-Reported Demographics of Study Participants.

Demographic Category	Percentage
Education	
High School	0.0
Some College	95.5
Bachelor's Degree	4.5
Master's Degree or higher	0.0
Race	
White	50.0
Black	36.4
Native American	0.0
Asian	4.5
Hispanic/Latino	4.5
Hawaiian/Pacific Islander	0.0
Annual Income	
$0-$15,000	68.2
$15,001-$25,000	22.3
$25,001-$35,000	4.5
$35,001-$50,000	0.0
> $50,000	4.5

Collection of In-Vehicle Data

The vehicles used in this study were originally instrumented for a federally funded study (Integrated Vehicle Based Safety Systems, or IVBSS) of driver warning systems (Sayer et al., 2010). The driver alerts generated by those systems were disabled for the purposes of this study. The IVBSS system recorded a rich set of variables for the evaluation of driver behavior, vehicle motion, and the surrounding environment. The IVBSS dataset included: five video feeds

– forward scene, cabin, driver face, both sides; GPS location data at 4 Hz; seven radars – two each side, two rear, one forward looking; a camera-based lane tracking system; and measures of several vehicle parameters: throttle position, lateral acceleration, brake pressure, yaw rate, and vehicle speed. Examples of cabin and forward videos from the IVBSS system are shown in Figures 2 and 3, respectively. The primary limitation of the existing IVBSS system was that it could only record data when the vehicle ignition was turned on and the system booted up (approximately 40 seconds after the ignition was turned on). This limited the value of the existing IVBSS system for the study of decisions to use or not use seatbelts, as events just prior to and immediately following the ignition being turned on may be important for understanding belt use decisions. For this reason, the IVBSS system was supplemented with a custom designed seatbelt data acquisition system (DAS) for this study. The seatbelt DAS was activated by the opening of one of the vehicle's doors and, because it utilized flash memory, it could begin recording in-vehicle video within 4 seconds.

Figure 2: Sample Video from IVBSS System's Cabin Camera.

Figure 3: Sample Video from IVBSS System's Forward Camera.

The seatbelt DAS recorded the state of six inputs (four doors, ignition, and driver seatbelt buckle) and video from a camera mounted above the rearview mirror, as shown in Figure 4. This

system logged all input state changes, and began recording video within 5 seconds of a change in any of these inputs. The system continued recording data for a period of 2 minutes, unless one of the six inputs changed state or the ignition key remained on. If an input changed state, the 2 minute timer reset. Video was recorded continuously while the ignition was on, and for 2 minutes after the ignition was turned off. In order to record clear video during nighttime, five infrared illumination sources were installed in each vehicle. The infrared sources were on whenever the DAS was functioning. The seatbelt DAS was installed behind the rear seat back in a locked compartment inaccessible to the driver. A diagram of the seatbelt DAS components is shown in Figure 5.

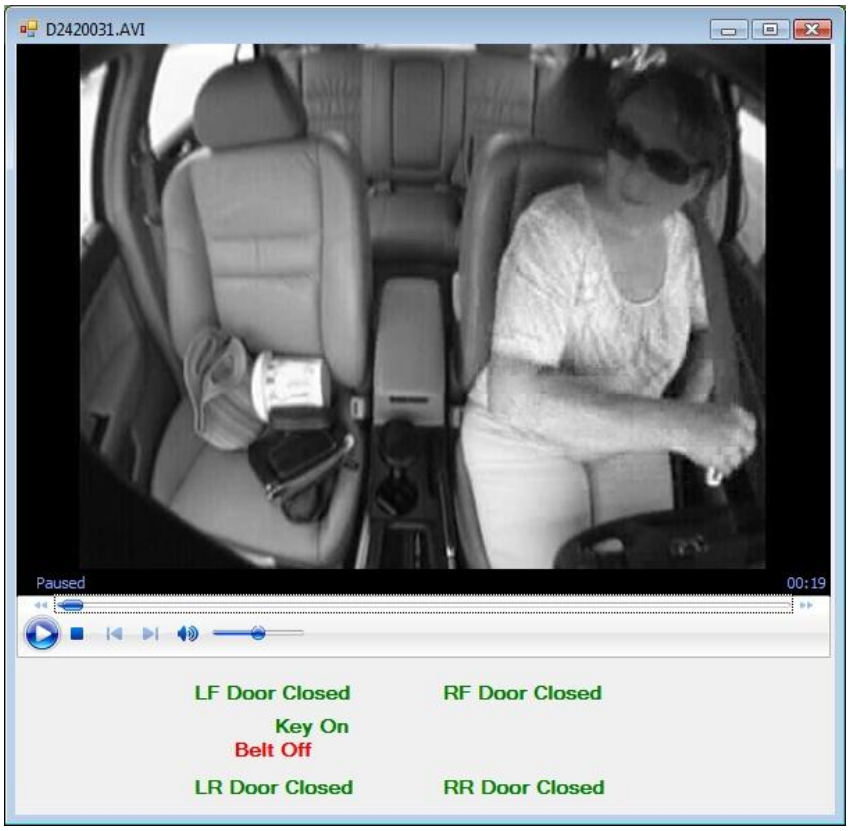

Figure 4: Sample Video from the Seatbelt Data Acquisition System Camera Located above the Rearview Mirror.

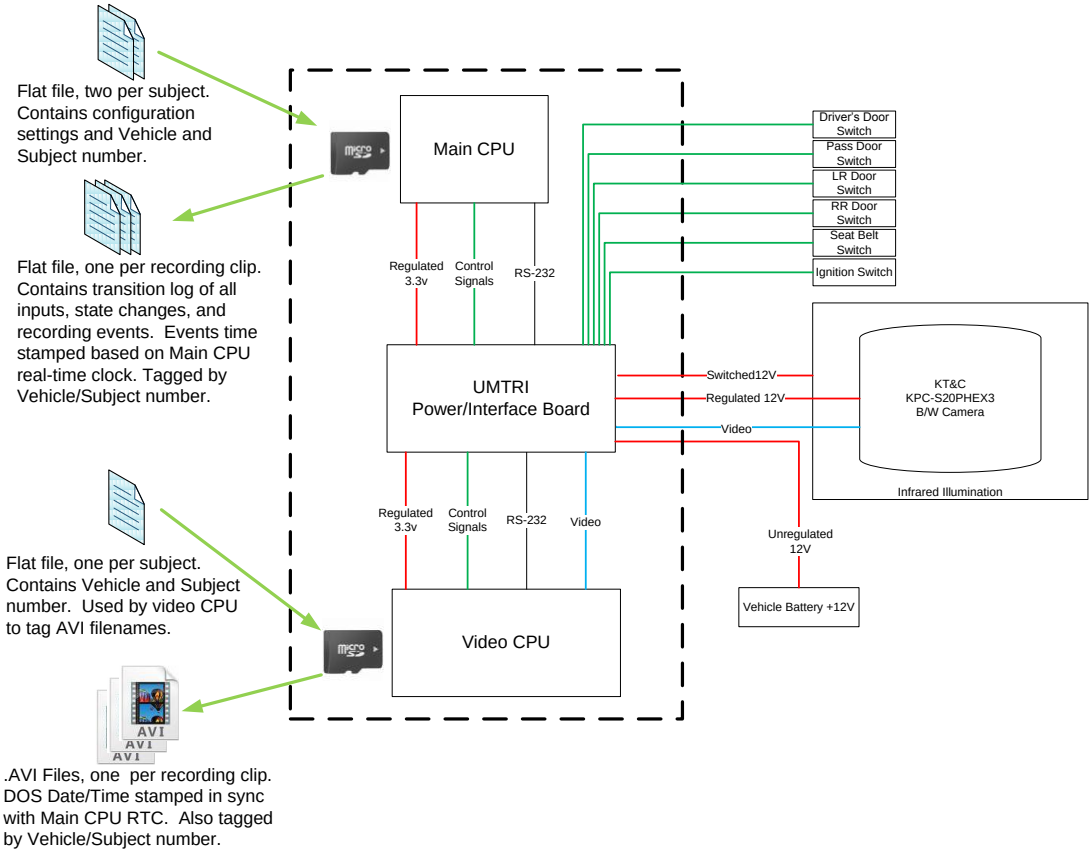

Figure 5: Diagram of the Components of the Seatbelt Data Acquisition System.

Downloading and Processing of In-Vehicle Data

When each vehicle was returned to UMTRI by the participant, two micro-SD memory cards were removed from the DAS. The data on these cards were moved to an UMTRI server. Data from the IVBSS system were moved to the same server over a wired Ethernet connection. Once all the data were moved, they were loaded to the SQL Server database.

The data timing for the seatbelt DAS and the IVBSS system were synchronized during initial data processing, using both systems' real-time clocks and the time stamps of ignition events, which were logged by both systems. In practice, the data from the two systems were synchronized to within approximately 0.1 seconds.

The SQL Server database allowed events (e.g., a seatbelt being unlatched while the vehicle is traveling more than 50 MPH) to be quickly identified using queries. Video and other data around those events could then be reviewed using a custom application which played back all the data sources synced in time. SQL procedures generated tables of events for each participant's data. This provided a list that could be queried by the member of the project team conducting the structured interviews to identify points of interest. When a non-driver door was opened, video was reviewed to determine if any passengers were present. If there were, the number of passengers for that trip segment was entered in a table to be used in data analysis.

Structured Interviews

Participants were contacted between 1-4 weeks after return of the research vehicle and requested to return to UMTRI for a focused interview. The interviews lasted approximately 2 hours. Each interview was divided into two segments, corresponding to the spot and policy

seatbelt decisions, respectively. Each segment was in turn structured around the cardinal decision issue perspective (CIP), discussed in the introduction.

In preparation for the structured interviews, participants' trip data were categorized based on the driver's belt use (fully belted trips, fully unbelted trips, and partially-belted trips), the presence or absence of passengers, and time of day (daytime, nighttime). A "trip" was defined as one ignition cycle with the vehicle in motion at a speed of at least 20 MPH. Trips in which the driving was done by persons other than the participant were excluded. "Partially-belted" trips were defined as trips in which the driver buckled or unbuckled at some time after the vehicle had already reached 20 MPH. It is important to note that we consider these partially-belted trips as "partial seatbelt use" which is quite distinct from "part-time belt use." Recall that we recruited participants based on their self-report that they either did not always use seatbelts or who reported at least one time in the past year in which they did not use a belt. We consider this part-time belt use. Similarly, during the structured interviews, we talked with participants about their general use of seatbelts and some indicated that they had policies that included specific circumstances in which they did not use belts. We have called these part-time belt use policies. Partial seatbelt use, on the other hand, refers to what is happening over the course of one specific trip; that is, during that specific trip, the belt is only used for part of the trip because of one or more instances of buckling or unbuckling during the trip.

Six trips were randomly selected from the 12 days of driving to discuss with each participant in the spot decision segment of the structured interview. For each participant, there were two trips for each of the three categories of driver belt use where possible. The presence or absence of a passenger and the time of day was balanced between the two trips to the extent possible.

The order in which trips were discussed in the structured interview was the same for each participant to the extent possible. The order of trips was: fully unbelted, fully belted, and partially belted. This order was repeated twice. Note that one participant had no fully unbelted trips, some participants never had passengers, and some did not drive at night. Because of this, some participants discussed as few as four trips while others discussed six trips.

Video clips of the selected trips and other trip-specific data were reviewed prior to the interviews to familiarize the interviewer with the participants' seatbelt use behavior and to infer how participants might address each decision cardinal issue. The review also helped identify any contextual cues that might be relevant to participants' belt behavior, e.g., passenger type, participant state, belt behavior.

Each structured interview began with a discussion of spot decisions. Questioning of participants' spot decisions was always done first to reduce the influences of the policy decision discussion on spot decision responses. Recall that spot decisions in this context are related to the actual decision made to use or not use a belt on a specific trip. The participant was presented with trip video of him (in the driver's seat) and the vehicle interior and given detailed trip information including the date, time, and location on a map to help the participant recall the trip from memory. The interviewer made sure that participant could correctly recall the specific trip and asked him to respond to subsequent questions from the perspective of that trip. The participant was then asked to describe his thinking and to respond to specific questions concerning his use or non-use of the seatbelt. It was sometimes necessary for the interviewer to forward and stop videos at various points of interest (e.g., to locate when participants put on their seatbelts during partially-belted trips). A complete interview guide for the spot decision discussions can be found in Appendix A. Once the discussion was completed for the first trip, the interviewer repeated the process from the remaining trips. Participants' responses were noted by the interviewer directly on the interview guide, along with the several direct quotes made by participants.

The second half of the interview was devoted to discussion of belt use policy decisions. During this part, participants were asked to think about their seatbelt use decisions in general terms and not in reference to any of the particular trips that were reviewed earlier. A detailed interview guide for the policy decision discussions can be found in Appendix B. Participants' responses were again noted on the interview guides.

Immediately after the each interview, participant responses were reviewed by the interviewer and initial conclusions were made about how each decision cardinal issue was addressed for both spot and policy decisions. At the completion of all interviews, data from all participants were again reviewed and final conclusions were made, including comparisons with in-vehicle instrumentation data.

RESULTS AND DISCUSSION

Driving Overview

Collectively, participants drove for a total of 21,854 miles. Participants varied greatly in terms of the distances driven during their 12 days of driving, with participant driving distances averaging 993 miles (SD = 766 miles) and ranging from 305 miles to 3,479 miles. Overall, participants took 2,093 trips (recall that a trip was defined as the vehicle ignition being turned on to the ignition being turned off, and the vehicle speed at some point in the trip was at least 20 MPH). On average, participants took 95 trips (SD = 35 trips), with a range of 22 to 157 trips among participants. Table 3 shows the average percent, standard deviation, and range of trips with at least one passenger, trips during nighttime, and trips less than 2.5 miles (which we defined as short trips).

Table 3: Average Percent, Standard Deviation, and Range of All Trips by the Presence of a Passenger, Time of Day, and Trip Length.

Trip Factor	Average, %	Standard Deviation, %	Range, %
Passenger	35	21	2-74
Nighttime	44	13	26-81
Short	38	14	12-71

Seatbelt Use

Each trip was analyzed to determine the participants' use of a seatbelt. On any given trip, the participant either used his belt the entire trip, not at all, or put the belt on/took the belt off sometime during the trip (partial belt use trip). For the purposes of calculating trip belt use rates, we included partial belt use trips as "belted." Overall, the trip belt use rate was 88% (SD = 21%), with individual rates ranging from 3% to 100%. We also calculated trip belt use rates as a function of the presence of a passenger, time of day, and trip length. Paired sample t-tests were conducted to determine if use rates differed significantly within the two levels of each variable. The trip belt use rates and the results of these analyses are shown in Table 4.

Table 4: Average Trip Belt Use Rates, Standard Deviations, t-test Statistics, and Probability as a Function of the Presence of a Passenger, Time of Day, and Trip Length.

Factor	Trip Belt Use Rate, %	Standard Deviation, %	t-test	Probability
Passenger No Passenger	90 84	18 22	t(21) = 2.79	$p = .011$
Nighttime Daytime	85 89	23 20	t(21) = 2.28	$p = .033$
Short Trip (<2.5 miles) Long Trip	77 93	25 21	t(21) = 4.80	$p < .001$

As can be seen in Table 4, trip belt use was higher when a passenger was present, during the daytime, and on trips of 2.5 miles or longer. Each of these differences was statistically

significant. In order to normalize the positively skewed belt use rates in our study, we applied an arcsin non-liner transformation to the rates. Paired samples tests on the transformed rates also showed that each of the differences were statistically significant.

Structured Interviews

The results for the 22 participants are separated according to the two types of decisions addressed in this project: policy and spot seatbelt use decisions.

Policy Seatbelt Decisions

Table 5 shows participants' self-reported policies regarding use of seatbelts. Of the 22 participants interviewed, 12 reported following some sort of policy about whether to use a seatbelt while driving. The other 10 participants said that they did not follow a policy and that they make the decision to use or not use a seatbelt on every trip. Of those who reported following a policy, five policies were reported. Seven of the participants who reported following some kind of policy regarding seatbelt use said their policy was to *always* use their seatbelt (Policy 1). These participants said that they followed their policy almost always without fail, and attributed any departure from the policy to "spot" decisions that had to do with either a short trip distance, distraction, or simply forgetting. Five participants reported deviating from full seatbelt use as a consequence of following a particular policy other than Policy 1 (Policies 2-5). Those part-time use policies ranged from using seatbelts on all but short-distance trips, to some combination of conditions comprising using seatbelts when family members are riding along as passengers, or when driving at high speeds, at night, in severe weather conditions, or in areas known to have high police patrols. Further probing of the short-trip part-time policies revealed that participants regarded short-distance trips as being less than 2 miles or shorter than 5 to 10 minutes. Participants rationalized these policies on the grounds that seatbelt use was unnecessary given the low perceived likelihood of getting a ticket or having a crash. They attributed this lower likelihood to both the shorter trip time and the usually slower driving speeds that characterized short trips. The short-trips part-time seatbelt policy appears most consistent with the deviations cited for Policy 1, suggesting that the majority of young male drivers who have some policy of using their seatbelts tend to relax that policy, or even dismiss it, for short trips.

Table 5: Frequencies of Reported Seatbelt Use Policies

Seatbelt Use Policy	Frequency	Spot Exceptions
Policy 1: Always use seatbelt	7	Short trips, forgetting, distractions
Policy 2: Use seatbelt except for short trips	2	Forgetting, distraction caused by presence of other passengers
Policy 3: Use seatbelt except for short trips, but always use seatbelt if family members are passengers or when it is late at night	1	Familiarity with road and surroundings (only for night time rule)
Policy 4: Use seatbelt except for short trips, in areas known to have lots of cops, or when family members are passengers	1	None
Policy 5: Use seatbelt if mother or father are passengers, if driving at high speeds or in severe weather conditions	1	Comfort, forgetting
No policy regarding seatbelt use	10	

Another policy attribute reported by participants was to always use their seatbelt when driving with other family members in the car, specifically parents and younger siblings (Policies 3-5). This stood out from other policies in that most participants who reported it also reported stricter adherence to it, than say, the short-trip policy. Note that for all the part-time seatbelt use policies, the absence of the conditions for belt use does not necessarily mean nonuse. For example, a participant with a policy prescribing that he used a seatbelt when family members are passengers may also decide, on the spot, to use his seatbelt when driving alone as well. He just does not have a particular policy to follow when, say, driving alone. Thus we can speculate that the 10 participants who said that they did not follow any policy about when to use their seatbelts, were in effect, deferring their decisions on seatbelt use to be made on the spot. Given that participants expressed a number of different policies regarding use of seatbelts, we analyzed trip seatbelt use as a function of reported policy. The results are shown in Table 6. As shown in this table, participants with a full-time belt use policy used their belts on 97% of trips, those with no policy used belts on 93% of trips, and those with a part-time policy had the lowest use at 67%. A one-way ANOVA showed that there was a statistically significant difference between belt use rates: $F(2,19) = 4.49$, $p = .025$. Tukey post hoc tests showed that the belt use rate for participants with part-time seatbelt use policies (67%) was significantly lower than the rates of those with full (97%, $p = .028$) or no seatbelt use policies (and 93%, $p = .049$). There was no statistical difference between these latter two belt use rates. These analyses were repeated for the transformed rates and similar results were found.

Table 6: Observed Seatbelt Use Rates by Reported Policy and Trip Distance

Seatbelt Use Policy	N	Trip Seatbelt Use Rates, % (SD%)	Average Trip Distance, Miles (SD)	Seatbelt Use Rates for Short Trips, % (SD%)	Seatbelt Use Rates for Long Trips, % (SD%)
No Seatbelt Use Policy	10	93 (8)	9.9 (5.2)	78 (21)	96 (4)
Policy 1: Full Time Belt Use	7	97 (3)	14.7 (6.6)	92 (6)	100 (1)
Policies 2-5: Part-time Seatbelt Use	5	67 (38)	6.0 (2.3)	52 (31)	76 (43)
Total	22	88 (21)	10.5 (6.0)	77 (25)	93 (12)

To further investigate why those with a part-time belt use policy had such low use of belts, we calculated the average trip length among each of the three groups. We found that those who reported part-time seatbelt use policies tended to take shorter distance trips (trip distance mean = 6 miles; SD = 2.3 miles) than those with no policy (trip distance mean = 9.9 miles; SD = 5.2 miles) or a full seatbelt use policy (trip distance mean = 14.7 miles; SD = .6.6 miles). An ANOVA calculated on participants' reported seatbelt use policies and the average distance of trips they drove during the 12 days of data collection showed that the average trip distance varied significantly as a function of the reported policy [$F(2,19) = 7.79$, $p = .004$]. Tukey post hoc tests showed that this main effect resulted from a significant difference in average trip distance between participants with a part-time use policy and those with a either no policy or a full-time use policy. Interestingly, participants with part-time seatbelt use policies did not mention that they drove many short distance trips or that when compared to others they drove shorter trips.

One explanation for this is that those participants with part-time seatbelt use policies made such policies because they tended to also make more frequent short trips. That is, their (short-distance) trip characteristics called for policies that permitted seatbelt nonuse on those

selected trips, and required its use on longer trips. Surprisingly, as shown in Table 6, all participants, regardless of policy, had lower belt use during short trips, with the belt use percentage point difference between the two trips lengths being about the same for participants with no policy and those with a part-time policy (18 and 24 percentage points, respectively). Thus, the interaction between short trips and belt use policy decisions needs further investigation.

Policy Seatbelt Decisions – Cardinal Issue Perspective

Preliminaries: Need, Mode, and Investment

Need Issue. Discussions of how participants came to adopt their particular seatbelt use policies revealed the influence of circumstances surrounding their early years of driving—either the participant, or someone they knew very well, was involved in a vehicle crash which made them appreciate the value of seatbelt use; and/or the participant was brought up to believe in the importance of seatbelt use, sparked by whatever their parents and driver's education instructors told them in their early driving years as well as accumulated exposure to seatbelt related statistics. For these participants, the crashes they or their friends had experienced were vivid in memory, and they recounted the incidents with passion as justifications and explanations for their decisions to adopt seatbelt use policies. One participant said the following: "My friend had an accident in 2003, I was in the car with him. We were OK, but he was more hurt than me because he didn't have his seatbelt on. At that time I didn't have that rule, I just happened to put on my seatbelt. But after that incident it became a regular habit to always wear my seatbelt."

For participants who reported not following any seatbelt use policy while driving, further questioning revealed that they were not necessarily against having seatbelt use policies, but rather the idea of setting up a policy never crossed their minds. This suggests that the main driver of the "decisions" to not have seatbelt policies was their handling of the need issue, with the default decision being to not have a seatbelt use policy, and go about making seatbelt use decisions on the spot. It is possible that these participants either were never exposed to circumstances that would have triggered the need for some seatbelt use policy (e.g., neither life-changing crashes nor upbringing in pro-seatbelt use family cultures), or they were never affected by such circumstances as were those who ended up making seatbelt use policies for themselves.

As a practical implication, it would seem that simply getting the policy issue under consideration would be enough to trigger the need issue, which would in turn lead to more adoption of seatbelt use policies, and subsequently higher rates of seatbelt use. It would seem imperative, and not surprisingly so, that parents and driver's education instructors should attempt to instill in young drivers the habit of seatbelt use early on, to avoid the necessity of making the belt use decision on individual driving occasions and risking making an instantaneous decision to drive unbuckled. Further research is needed to better understand this issue.

Mode Issue. Participants consistently said that they devised and adopted their respective decision policies themselves. Information and advice provided by parents and instructors, often regarded as role models, served only to reinforce the importance of seatbelt use and make it more natural for them to adopt such policies; that is, that making their seatbelt use policies just felt right. When asked to explain the approach to coming up with his seatbelt use policy, this participant's statement represented most others: "I went with what felt right based on my past experiences. I never really analyzed why it's important to make a policy for myself." Only one participant said that he approached the decision to come up with a seatbelt use policy somewhat analytically, while also suggesting an experiential approach at the same time.

Investment Issue. Every participant said that he spent little or no time in coming up with his seatbelt use policy. A common sentiment was illustrated by a comment made by one participant: "I didn't spend nothing (sic), I just naturally knew what to do." Another said, "It just

felt like the right thing to do given my experiences and my accumulated exposure to pertinent information, including seatbelt safety statistics."

Core Issues: Options, Possibilities, Judgment, Value, and Tradeoffs

Overall, participants had little to say about the core decision issues. Presumably, this was because the participants who had decided to make seatbelt use policies for themselves did so as a result of circumstances that consistently pushed for as close to full seatbelt use as possible, with some slightly more lax seatbelt use policies (e.g., making exemptions for short trips). In other words, they were participants who were "pro-seatbelt use," as a general principle, and made their policies according to their judgment and lifestyles and what they figured to be a more reasonable policy to follow. There were no participants in this analysis who contemplated holding a seatbelt use policy (and hence actually addressed these core cardinal issues) and then decided to *not* have a seatbelt use policy or to have one that prescribed nonuse.

Options Issue. All but one participant with a full-time seatbelt use policy said that they saw no other alternatives to their policy. Most said something similar to what one full-time policy participant said: "I saw no other alternatives, not even the option to not wear my seatbelt." The participant who was an exception reported having pondered a partial seatbelt use policy, in which he would "only wear a seatbelt when there is a high chance of being stopped by police." Again, this bias might be explained by the selection of these participants. These were participants who had circumstances that triggered the need for a seatbelt use policy, and not the full range of drivers at large. For most of these participants, whatever their seatbelt use policy, it somehow surfaced as the natural thing to do given their experience and upbringing and they made no effort to try to generate alternative options.

A few of those with part-time seatbelt use policies reported considering a full-time belt use policy, but none adopted this rule. No participants mentioned full-time nonuse of seatbelts as an option. For example, one participant characterized the consideration as, "…I guess I could *not* use my seatbelt, but that's not really an option." It is, however, assumed that this alternative is always present if not acknowledged by participants. To that extent, our participants may have dismissed the full seatbelt nonuse alternative from their viable option set very early on and surely before considering the possibilities, judgment, and values issues.

Possibilities Issue. Participants mostly agreed on the different possibilities that could happen as a result of varying degrees of seatbelt use, namely, getting injured in a crash and getting a ticket for not wearing a seatbelt, also noting their ability to avoid the unpleasant outcome. What seemed most prominent were arguments raised by some part-time policy participants. One participant explained his take on the utility of having a seatbelt policy with respect to these two possibilities, explaining that "having a rule is good because sometimes you could forget to follow it but most times you do follow it, and when you don't follow it then you are reminded that you are not doing the right thing. Besides, if I don't wear my belt, then my brothers would probably not be wearing their belts either, and they could all be injured in an accident, which would be avoided if I had my belt on."

Judgment Issue. When asked to report what they believed to be the probabilities of their stated consequences happening as a result of having their respective seatbelt use policies, all but one participant said with confidence that always having the seatbelt on would always reduce injury in a crash and always prevent getting a ticket. This "outlier" participant said that the chance of being hurt in a crash was 50-50, presumably based on his general beliefs about the uncertainty of things in life. One participant with a policy of not using his seatbelt on short trips argued that his policy does not make these possibilities any more likely to happen. He explained that from experience, he "never got pulled over for not wearing his seatbelt on a short trip." Another one admitted that his distance-related part-time seatbelt use policy would allow for slightly increased risk of getting a police ticket. He said, "My luck could be that police are

behind me and give me a ticket even though I'm only going a short distance." Interestingly, neither driver brought up the risk of injury in a crash when discussing the judgment issue.

Value Issue. Most participants said that besides themselves, they thought that family and friends would also care whether or not the possibilities—injury in a crash or a ticket—were to actually happen. One participant's comment was particularly illuminating. "Let me clarify," he said, "I'd not be happy if an accident was to happen, but I'd be happy that I had my seatbelt on if it were to happen." Another participant explained that he would be extremely unhappy if he got a seatbelt ticket because his "record is clean and getting a ticket would mess it up." Surprisingly he had a part-time seatbelt policy, which is at best explained by part-time seatbelt policy holders' belief that their policies are nearly as good as full-time seatbelt use policies in preventing, say, tickets.

Tradeoffs Issue. In discussing the strengths and weaknesses of the different seatbelt use policies, participants restated their belief that having a full-time seatbelt use policy was the only way to ensure the greatest reduction of injury in a crash, as well as to completely avoid seatbelt-related citations (see Table 7). Some participants also reported potential discomfort of using seatbelts, making it the only possible weakness of seatbelt use, but also saw it as an insignificant tradeoff to the benefits of seatbelt use. Still, they explained that they had no difficulty choosing their policy. One participant said, "I came to a point when I could say safety and long life are far more important than regretting any unsafe behavior; comfort wasn't an issue at all." This is consistent with the non-compensatory strategies of decision making, whereby the decider concludes that one set of advantages (disadvantages) are so critical that they cannot be offset by opposing disadvantages (advantages; Yates, 1990).

The most seriously considered tradeoff was for those with part-time seatbelt use policies who recognized that their policy left room for *some* chance of suboptimal injury reduction in a crash and of being ticketed during those selected trips in which they did not use their seatbelts. These participants reported resolving this dilemma by reasoning that the chance of getting in a crash or being cited for nonuse of a seatbelt was very small. They argued that their policy gets them almost the same benefits of full-time seatbelt use, with the added luxury of getting away with a few unbuckled trips. To the extent that these participants may have underestimated the likelihood of crashes and tickets on the particular trips on which their respective policies permits seatbelt nonuse, e.g. short-distance trips, this may explain why they too reported no dilemma in making their seatbelt use policy decision.

Table 7: Tradeoffs Entailed in Different Seatbelt Use Policies

Alternative	(Relative) Strengths	(Relative) Weaknesses
No seatbelt use policy	May be more comfortable	Safety, ticket
Policy 1: Always belt	Safety, no tickets	Maybe a little less comfortable
Policies 2-5: Part-time belt use (long trips, family passengers, and higher risk driving conditions)	Relative safety, almost no chance of ticket	Possible chance of getting a pulled over Higher chance of injury in a crash

Aftermath Issues: Acceptability and Implementation

Acceptability Issue. Discussion of the final two cardinal issues showed consistent agreement among participants that they made their seatbelt use policy decisions themselves, and for themselves. To the extent that their families and friends would care that they used seatbelts while driving, participants were insistent that they, themselves, were the sole benefactors of their

seatbelt use policies. There was no mention of the law or police enforcement as potential benefactors of seatbelt use policies. One participant's response to the question of who he thought would care about what and how he arrived at his seatbelt use policy was typical: "No one really that I thought of. Though initially my early training and habits started with my mom and driver's education instructor, I don't think anyone cares at this point about me having a seatbelt use policy." There was no mention of the law or police enforcement as potential stakeholders of the seatbelt use policies.

Implementation Issue. There was also no mention of any difficulties in implementing participants' seatbelt use rules, aside from occasional forgetting. Participants repeatedly said, sometimes jokingly, that "It's not hard to put on a seatbelt." One participant with a part-time seatbelt policy explained that because his vehicle is old and has both a seat and broken shoulder belt system, his policy makes things much easier for him since he would not have to go through the hassle of buckling on short trips. Note that this participant was an exception. On the issue of forgetting, one participant said that his vehicle did not have a seatbelt reminder system and wished that it did so he would never forget to follow his full-time seatbelt use policy. Two participants with full-time seatbelt use policies also argued, correctly, that it is in fact more difficult to not have a policy, because then they would have to make a seatbelt decision *every time* they got in their cars, as opposed to having the decision made in advance and just implementing it regularly.

This speaks to a very important point, which, if recognized, would explain the key benefit of setting up and following seatbelt use policies. That is, not only do full seatbelt use policies correlate with higher seatbelt use (see Table 6), they can also facilitate the task of seatbelt use itself (i.e., one would no longer have to go through making the seatbelt use decision on a daily basis). Moreover, implementing seatbelt use policies on a regular basis may even turn seatbelt decisions to automatic behaviors (habits), making them even less effortful. However, it appears from our findings that only a certain segment of drivers actually employ seatbelt use policies, with the others having not even entertained that option, and simply make their seatbelt decisions on the go. In addition, the investment costs that are referred to here were never mentioned in the spot decisions part of the interviews, suggesting, again, that participants are often not aware of the costs of deciding whether or not to put on their seatbelts on a case-by-case basis. As a recommendation for increasing seatbelt use among this population, it would seem to make sense to encourage drivers to set up seatbelt use rules early on to avoid the necessity of making the seatbelt use decisions on individual driving occasions and risking making such spot decisions to drive unbuckled.

Spot Seatbelt Decisions

This section presents our analyses of participants' discussions on the set of trips we selected from each participant's 12 days of driving. The findings are presented according to the cardinal decision issue perspective, combined across different seatbelt states (belted, not belted, partially belted) and trip characteristics.

Spot Seatbelt Decisions – Cardinal Issue Perspective

Preliminaries: Need, Mode, and Investment

Need Issue. Before a driver can make a decision about whether to use a seatbelt on a particular trip, he first needs to acknowledge the *need* to make such a decision--that there is a real "need" to make a decision to deal with an impending (if not already existing) significant calamity or opportunity. Participants' comments on their seatbelt-related thoughts and behaviors revealed five distinct patterns of behaviors and two distinct approaches for addressing the need cardinal issue of seatbelt decisions. These behaviors and approaches are shown in Table 8. In

"obliviousness," the driver makes no attempt to detect possible impending opportunities or threats that would warrant an effort to decide how to address opportunities or threats via making a decision to use a seatbelt. He either used or did not use his seatbelt, per his usual habit. On the other hand, other participants followed the "demand/response" approach. In these cases, participants are subjected to a request or demand to make a decision to either use or not use a seatbelt. This demand may be explicit, such as the case with seatbelt reminder systems, or it may be more implicit, such as the case where the mere presence of a passenger or severe weather conditions dictated to the driver the need to use a seatbelt.

Table 8: Seatbelt Use behaviors and the Different Ways of Addressing the Need Issue	
Seatbelt Use Behavior	**Approach**
Participant puts on seatbelt upon entering vehicle, automatically, without thinking about it	Obliviousness
Participant does not use seatbelt in entire trip; possibility of using seatbelt never crosses his mind	
Participant puts on seatbelt upon entering vehicle, reminded by some trigger	Demand/Response
Participant puts on seatbelt late into the trip; possibility of using seatbelt does not cross his mind at first but some reminder later on triggers the need for a seatbelt decision	
Participant does not use seatbelt in entire trip; possibility of using seatbelt comes to mind but participant decides to not put on seatbelt (Decision may be made upon entering the vehicle or later)	

On belted trips, participants consistently explained that they put on their seatbelts automatically and without thinking. One participant's response was typical of others in that category: "I just put on my seatbelt out of habit, it's like what I always do and I don't even think about it." A similar approach to the need issue was apparent for most non-belted trips. When asked about their seatbelt-related thoughts for non-belted trips, participants most commonly said something like: "…I wasn't thinking anything; the idea of using my seatbelt never even crossed my mind."

It also appeared that trip length was an important factor influencing how participants addressed the preliminary cardinal issues, and their subsequent seatbelt use spot decisions. Specifically, some participants who said that they did not even *consider* using their seatbelt on a given trip also alluded to the shortness of the trip length. To the extent that they addressed the need issue through "obliviousness" it would seem impossible for distance considerations to enter into the decision process. Thus, we propose two competing models to represent the role of habit in seatbelt use. It appears from participants' responses that there is, first, one main habit for the average trip, which could dictate, for example, full seatbelt use, and then another habit specific for short trips, which dictates no seatbelt use. Thus, the participant would engage the appropriate habit given the anticipated length of the particular trip. There would also have to be some trigger that would shift a person's attention from one habit to the other (e.g., knowing the destination of the trip prior to entering vehicle) without having to actively consider the use or nonuse of the seatbelt.

Thus, it is clear that habit plays an important role in making (or not making) spot seatbelt use decisions. In either case, when a person's habit accounts for his seatbelt use or nonuse, that seatbelt spot decision is the simplest and the least cognitively-demanding, since the seatbelt behavior occurs automatically without further engagement of the subsequent decision issues. Note also that there was some similarity in mechanisms between these habits and the seatbelt decision rules discussed in the Policy Seatbelt Decisions section. Regular implementation of

seatbelt use decision rules can automatize seatbelt behavior into habits. Note also the important role of trip length for both spot and policy seatbelt decisions.

There also appeared to be two factors that disrupted regular habits. First, there were "distracters" (e.g., passengers, cell phone) that participants sometimes said disrupted their habit of regular seatbelt use. There were also "reminders" (e.g., passengers, the seatbelt reminder system, or weather/road conditions) that sometimes reminded participants who were otherwise oblivious to the need to make a seatbelt decision that they do, in fact, need to make such a decision (see "demand/response" section of Table 7). This helps to explain the delayed seatbelt behavior of some participants in partial seatbelt use trips.

Mode issue. In most cases, participants said that no one besides themselves had a role in their decision to put on their seatbelt. But in cases when a passenger was present, participants usually gave a partial role to the passenger, acknowledging his or her influence while adding that they would probably had used the seatbelt even if driving alone. One participant gave a larger role to passengers and explained for a case in which he was driving unbuckled along with an unbuckled passenger: "Usually when I'm with a passenger who doesn't have his seatbelt on I usually mimic. So it may be that if he had his seatbelt on or said something then I would have put it on." There were also some mentions of the vehicle's seatbelt reminder system.

Investment issue. As these are split-second decisions, the investment issue seemed irrelevant. Participants did not spend any time or effort thinking about the seatbelt use decisions for the cases presented in the interviews.

Core Issues: Options, Possibilities, Judgment, Value, and Tradeoffs

These core cardinal issues were only addressed for cases in which the participants recognized the need to make a seatbelt use decision, which excluded all "habit" cases. Moreover, many of those cases were in turn not discussed because participants said they made their decisions to put on their seatbelts immediately following their acknowledgement of the need to make the decision but did not really address any of the core issues for those particular cases. For the remaining eligible cases, participants had little to say, and with little variation, regarding the core cardinal decision issues.

Options Issue. Participants did not acknowledge options other than using or not using their seatbelts. Of all the driving cases presented in the interviews, there was just one case in which a participant "faked" seatbelt use by only putting the seatbelt over his shoulder. He explained that he was just being "lazy" by not buckling for the entire trip, and did the minimum required to avoid a police ticket.

Possibilities Issue. Participants cited injury in a crash and getting a seatbelt citation as the two main consequences of the seatbelt use decision. Some participants mentioned comfort as a "somewhat" legitimate consequence. For some trips, participants only mentioned crashes while in others they only mentioned citations.

Judgment Issue. While participants were not confident about their estimated probabilities of a crash or citation outcome actually happening, they all agreed that using the seatbelt would reduce injury in a crash and eliminate the possibility of getting a seatbelt-related citation.

Value Issue. Participants cited family members, and sometimes friends, as people who would care about those consequences if they were to happen. Not surprisingly, injury in crash was of highest value, followed by the seatbelt-related citation. Indications of why family members would care if participants were injured ranged from merely caring about their wellbeing to caring that participants remained alive and in good health to take care of them later in life. Indications for why family members would care about seatbelt citations ranged from making sure that the participant would maintain a good driving record (and remain eligible to drive) to caring because they (the families) would in fact have to pay for those tickets. Comfort was often dismissed at that point.

Tradeoffs Issue. For participants who addressed the tradeoffs issue in spot decisions, they resolved it as easily as they did when considering policy decisions. Participants cited two advantages of using a seatbelt—reduced injury in a crash and avoiding citations—and made no serious consideration of other factors, such as discomfort, as a tradeoff. Often participants put safety first, although some participants reported putting on their seatbelts more to avoid getting tickets. One participant explained: "I thought my record is clean and I should keep it clean, and so I should put on my seatbelt. I didn't think about safety because it was late and the roads were empty." This does not mean that these participants value material costs more than their safety, but perhaps they have more faith in their driving and think crashes are more avoidable than citations. This is only one possible explanation and more research is needed to better understand this outcome.

Note that there was never a case in which a participant actually addressed the tradeoffs issue and then decided against using his seatbelt. In fact, in the cases in which participants did not use their seatbelts, the tradeoffs issue did not appear to be addressed explicitly at all. Often it seemed that the participant failed to use his seatbelt because he took an obliviousness approach to the need issue. That is, he recognized no threat or opportunity that induced him to make a decision about using or not using his seatbelt, and the default action was to not use his seatbelt.

Aftermath Issues: Acceptability and Implementation

Acceptability Issue. While most participants reported that family members cared about the consequences that could result from their decision to use or not use a seatbelt (value issue), most participants did not think, at the time of the trip, that anyone besides themselves would have cared one way or another about the seatbelt use decision. There were a few cases in which participants actually mentioned either their families or the passenger(s) who were with them at the time, in which cases the issue was addressed with the decision to wear the seatbelt.

Implementation Issue. As these are split-second, "spot" decisions, with the seatbelt use behavior happening at the same time as the decision, the implementation issue was not acknowledged by participants. That is, because the action follows immediately after the decision, there is little opportunity for implementation to fail.

CONCLUSIONS

This study used custom designed in-vehicle technology to investigate seatbelt use decisions as they occurred during naturalistic driving among a sample of 22 young male drivers who by self report did not always use seatbelts. Interviews with each participant, supplemented by actual driving data including video, were conducted to investigate the decision making processes related to the use of seatbelts. The interviews and interpretation were guided by the cardinal decision issue perspective. Two types of decisions were investigated: policy and spot seatbelt use decisions.

Based on the results of this study, the following conclusions can be made:

- Overall trip belt use, even among this population of self-reported part-time users, was relatively high at 88%.

- However, belt use varied by three important trip conditions that were examined – time of trip (day versus night), length of trip (short versus long), and whether there was a passenger. Belt use was higher for daytime trips, long trips, and trips in which there was a passenger.

- The short length of a trip was a consistent factor in discussions of seatbelt nonuse policy and spot decisions, even to the extent that some participants had policies in which they did not use belts on short trips. The reasons for not using a belt on short trips generally related to the lower perceived risk of a crash or seatbelt citation. Indeed, observed belt use was only 77% on short trips (compared to 94% on long trips). Efforts should be made to increase awareness of the fact that crashes often occur on short trips.

- Having a seatbelt use policy was associated with higher belt use only if that policy called for always using a seatbelt. Those with a policy that called for belt use only under certain conditions had lower belt use than those with no policy at all. Given that most part-time policies included some provision for not using belts on short trips and given that people with these policies tended to take short trips, this finding was not surprising. Thus, it is not just having a policy that leads to increased use, but having the right policy. Efforts should be made to get young drivers to adopt full-time belt use policies.

- Although perceived risk of a crash or getting a ticket came into play in some of the policy and spot decisions, there were clearly other factors that were important that had little if anything to do with risk perception. These non-risk factors need to be furthered explored and incorporated into efforts to increase belt use among part-time users rather than focusing solely on influencing perceived risks.

- One non-risk factor influencing belt use decisions that clearly emerged was habit. For example, many participants with a full-time belt use policy reported that their use of belts was simply a habit. Efforts on the behalf of driver educators and parents to instill the habit of belt use in young people will free young drivers from the necessity of having to make belt use decisions on a trip-by-trip basis (many of which will result in driving unbuckled).

- Efforts to instill seatbelt habits, as well as other efforts to get young drivers thinking about seatbelt policies, are especially important because they may help trigger the need issue, which in our study was closely tied to whether participants had a policy. That is, many of those who did not have a seatbelt policy tended to attribute the lack of a policy to the fact that they never even thought about needing to set such a policy.

- Although one benefit of having a full-time seatbelt use policy is that it frees individuals from having to expend the effort to make a belt decision on every trip, most participants in our study seemed to be unaware of the investment costs associated with such trip-by-trip decisions. At the same time, most people of all ages value their time. Efforts to get young drivers to adopt full-time belt use policies should consider messages that emphasize the savings in time and effort associated with having such policies in place.

- Examination of the value issue in both policy and spot seat belt decisions showed that thoughts about family and friends influenced participants' decisions. This influence had to do with how an injury/fatal crash or ticket involving the participant affected him directly in terms of his ability to contribute to the wellbeing of family and friends, such as not being able to take care of parents in older adulthood. This result suggests that belt use promotion programs and messages should attempt to get part-time seatbelt users to think about how family and friends could be impacted by decisions to not use a belt.

- These preliminary findings relative to policy and spot seatbelt decisions are intriguing and certainly support the call for further research in this area. The framework of the 10 cardinal decision issues, especially if replicated in future belt studies, could serve as a useful model for not only understanding individual differences in decision making about belt use, but also tailoring interventions to increase belt use to the specific decision making characteristics and strategies of the individuals being targeted.

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Appendix A: Interview Guide 1 – Spot Seatbelt Decisions

Participant _____

SPOT SEATBELT DECISIONS

Structured Interview: Subject shown video and asked to describe his thinking and to respond to specific questions concerning his use or non-use of his seatbelt. Code responses for how subject addressed each cardinal issue. Analyst may stop video at points of interest (if identified in the pre-interview viewing of the video) and ask questions to clear up specific ambiguities about how the subject resolved particular cardinal decision issues.

"Welcome and thank you once again for taking part in this study. We have looked at the videos from your driving and would like to share and discuss with you some of those videos. As we are watching, our focus will be on various specific aspects of your decision to use or not your seatbelt. In general, I would like you to describe what you were thinking in terms of the seatbelt—your train of thought. I will also ask you some more specific questions about that. If, at any point you would like to stop the video, say, to collect your thoughts, please just say 'Stop.' Do you have any questions? Let's begin."

SPOT DPA – SUBJECT # _____ CASE # _____ Trip # _____
Trip Date _____ Time _____ Segments/Distance _____
Seatbelt Decision (circle one): *Used belt (B) Didn't use belt (NB) Part Time Belt (PTB)*
Passengers: Number ____ Relationship _____
Time of trip: Day / Night Type of trip: Local / Highway

"On this trip, you will recall, you (never) used your seatbelt. To refresh your memory of the trip, let's look at the first few seconds of the video." [The analyst shows the first 15 seconds (approx.) of the video, or until the subject remembers the trip, then continue onto the questions, while the video is playing, with the audio lowered to reduce distraction.]

Issue 1—Need: *"Is there some threat or opportunity here that should compel me to make a decision about whether to wear my seatbelt?"*

Q1 NEED: *"As clearly as you can, please tell me what, if anything, you were thinking at this point that might conceivably be related to using a seatbelt."*
"Did the possibility of using your seatbelt in fact cross your mind? Please explain."
"As best as you can recall, what do you think were the reasons that the possibility of using your seatbelt came to mind?"

Note: If the possibility of using a seatbelt never came to mind (or, "obliviousness"), we know that the decision was not analytic or rule-based but instead experience-based. The interview could stop there.

- **Trip interview coding: 1—Need:**

Strategy*	Observation Category	Check (If Present)	Specific Indication
1: Obliviousness	a: Never mentions belt		
	b: Never apprehends belt, e.g., looks at, touches		
	c: Performs incompatible tasks, e.g., uses phone		
	d: Other (specify) (could include "automatically" putting on belt)		
2: Vigilance	a: Deliberately apprehends belt, e.g., looks at, touches		
	b: Purposely looks around outside car, e.g., at traffic		
	c: Mentions belt		
	d: Mentions assoc. risk—crash, police, others		
	e: Other (specify)		
3: Demand/response	a: Other party mentions belt		
	b: Other party mentions related risk, including regarding belt		
	c: Other "party" (e.g., **buzzer system**) or condition (e.g., **weather**) "requests" belt/no belt		
	d: Other (specify)		

***Obliviousness:** the person makes no attempt to detect possible impending opportunities or threats that would warrant an effort to decide how to address said opportunities or threats via using a seatbelt; **Vigilance:** the person makes a purposeful attempt to detect possible impending opportunities or threats that would warrant an effort to decide how to address said opportunities or threats via using a seatbelt; **Demand/response:** the person is subjected to a request or demand to make a decision to either use or not use a seatbelt.

Issue 2—Mode: *"Who should I get involved in making this decision about whether I will wear my seatbelt now, and who will* **actually** *get involved? What approaches will these people—including me—adopt in making this decision?"*

Q2 MODE: "Please tell me about who else, *if anyone, had a role in your decision to wear or not you're your belt here, whether that person was physically present or not. How about any 'thing' that might have been involved, too, such as a source of information or some kind of device or tool?"*

Q2b: So, you said that you made the decision yourself about whether to use your belt in this instance. As best as you can, would you describe how you made that decision? Would you elaborate?

[Might need to ask 'probe' questions, to be able to fill the approach table below]

- **Trip interview coding: 2—Mode:** *[Code standard decision process roles—self, agent, consultant, model—and standard approaches adopted by the participants in those roles—analytic, rule-based, experience-based:]*

Role: Who/What*	Involvement/Approach (Analytic/Rule/Experience)**	Specification/Details
Self/Driver		
Agent(s) (e.g., decide *for* driver) (1 line for each; note whether companions present)		
Consultant(s) (e.g., advice, *including buzzer*) (1 line for each)		
Model(s) (e.g., first "demo") (1 line for each)		

***Roles: Self/driver:** the legally authorized seatbelt-use decision maker; **Agent:** decides for authorized decision maker, the driver, e.g., engages seatbelt for driver, of own initiative; **Consultant:** gives advice, input, e.g., asks or tells driver to put on or not put on belt, and why; **Model:** makes own decision prior to driver's seatbelt decision, which the driver then appears to observe and mimic.

Approaches: Analytic: thinks through problem from "scratch," first principles, anything that "works"; **Rule-based:** invokes rule thought to be applicable; **Experience-based:** "habit," "learned"

Issue 3—Investment: *"What should I spend—in time, aggravation, or anything else—in figuring out whether to put on my seatbelt right now?"*

Q3 NEED: *"Would you please tell me how much effort, time, or anything else you spent in thinking about whether or not to wear your seatbelt here?*

"As best as you can, please tell me how you arrived at <u>that</u> amount of effort, time, or whatever, rather than, say, something less or more."

- **Trip interview coding: 3—Investment:**

Consideration*	Check(If Apparent)	Specific Indication(s)
Costs/resources of any kind		
Principle 1: Limits		
Principle 2: Reducible Decision Risk		
Principle 3: Decision Planning & Budgeting		
Principle 4: Minimization		

***Consideration: Costs/resources of any kind:** subject appears to take into account any costs or resources expended in the process of deciding whether to use the seatbelt, e.g., mentions aggravation over having to decide; **Principle 1: Limits:** subject appears to consider the importance of the decision relative to the burden of making that decision, e.g., mentions whether (not) worth the effort of deciding (not the effort of executing the decision, i.e., putting on the belt); **Principle 2: Reducible Decision Risk:** subject appears to believe that the quality of the resulting seatbelt decision was or was not responsive to the kinds and amounts of resources devoted to the decision process, e.g., "it doesn't matter how hard I think about it …"; **Principle 3: Decision Planning & Budgeting:** subject appears to lay out a plan for making the seatbelt decision, along with means for covering the costs associated with carrying out that plan; **Principle 4: Minimization:** subject appears to make a deliberate attempt to minimize the costs of making the seatbelt decision.

Issue 4—Options: *"What are potentially 'reasonable' alternatives for dealing with this problem of whether or not to wear my seatbelt right now? How could I go about identifying or creating such options?"*

Q4 OPTIONS: *"In this situation, as you indicated, you considered either using or not using your seatbelt, right? (Pause) Were there <u>other</u> alternative actions you considered taking besides those?"*

"What are those other alternatives?"

"As best as you can recall, what did you do to bring those alternatives to mind? What made you think of them?"

- **Trip interview coding: 4—Options:**

No. of Options Recognized (Check)	1	2	3+ (Specify): _____
Specific Indications of Recognized Options			

Note: Beyond simply fastening the seatbelt and not fastening the belt, other options might include ones such as various kinds of evasion, e.g., fastening the belt and then sitting on it.

Creation/Identification Approach*	Check(If Apparent)	Specific Indication(s)
Waiting		
Exhortation		
Invitation		
Consultation		
Emulation		
Exhaustive Search/Generation		
"Brainstorming"		
Derivation		

***Approaches: Waiting:** subject appears to passively wait for options to present themselves; **Exhortation:** subject urges self and/or others to work hard to identify or generate options ; **Invitation:** subject invites others to suggest options**; Consultation:** subject seeks out others to recommend options, under the assumption that they have pertinent expertise for doing so**; Emulation:** subject observes how others address similar problems, apparently successfully, and pursues the options they pursued**; Exhaustive Search/Generation:** subject attempts to identify "all," or at least large numbers of, viable options**; "Brainstorming":** subject attempts to use a collection of people to identify or generate options, exploiting their multiple perspectives**; Derivation:** subject attempts to create viable options based on a presumed understanding of how things work in the pertinent arena.

Issue 5—Possibilities: *"If I were to wear my seatbelt on this trip, what are the various important things that could happen as a result? Similarly, if I were to NOT wear my belt, what are the important potential consequences? What are good ways to make sure that I actually bring the important possibilities to mind as I ponder what to do?"*

Q5 POSSIBILITIES: *"As you were thinking about whether to wear your seatbelt in this situation, what possible consequences of <u>not</u> wearing your bet crossed your mind?"*

"Similarly, what potential consequences of wearing your seatbelt came into your thinking?"

"As best as you can recall, what made those specific possible consequences enter your mind? What, if anything, did you do to bring them to mind?"

- **Trip interview coding: 5—Possibilities:**

Specific Possibilities Acknowledged (None specified → N = 0)	Indication(s) (e.g., via Utterances)
1:	
2:	
3:	
4:	
5:	

Approaches Used for Surfacing Possibilities	Indication(s) (e.g., via Utterances)
Consultation: Non-Experts (e.g., Peers)	
Consultation: Experts	
OPO Cycles (or Similar)	
Delay (e.g., "Sleeping on It)	
Deliberate Recall of Experiences Effort	
Derivation of What Makes Sense	
Other (Specify)	

Factors Plausibly Affecting Surfacing of Possibilities*	Indication(s) (e.g., via Utterances)
Aim Contentment	
Experience/Inexperience	
Stress	
Time Limitations	
Physical Prominence	
Companion(s)	
Temporal Immediacy	
Other (Specify)	

*__Aim Contentment:__ subject has achieved the aims of the original decision (e.g., getting to a particular place) and thus no attempt is made to surface possibilities; **Experience/Inexperience:** subject benefits from experience in similar situations or is inhibited from the lack thereof; **Stress:** subject's attention is restricted by the influence of stress; **Time Limitations:** subject has little time to devote to efforts to surface possibilities; **Physical Prominence**: subject's efforts to surface possibilities are limited by attention being occupied by physically prominent stimuli; **Companion(s):** subject's attention to particular possibilities is affected by companions' actions, including their mention of possibilities; **Temporal Immediacy:** subject's attention is preoccupied by possibilities that would emerge in the near vs. remote future.

Issue 6—Judgment: *"It occurred to me that, if I use (don't use) my seatbelt on this trip, one possible consequence would be _____ (e.g., getting seriously injured in a crash). What would be the chances that that actually* **would** *happen if I use (don't use) my belt?" (Similarly for all the remaining possibilities acknowledged.)*

Q6 JUDGMENT: *"A few moments ago, you mentioned (several) things that you thought could happen if you used your seatbelt and if you didn't. I'm going to remind you of each one. For each, please tell me, as best as you can, what you that its chances were."*

- **Trip interview coding: 6—Judgment:**

Specific Possibilities Acknowledged	Estimated Inferred Judged Probability (0% - 100%), Per Specified Indication(s)	
	Seatbelt Used	Seatbelt Not Used
1:		
2:		
3:		
4:		
5:		

Issue 7—Value: *"I have envisioned a number of possible consequences of driving on this trip with (without) my seatbelt fastened. For each of them, how much would I and anyone else involved really care about those consequences if they actually came about?"*

Q7 VALUE: *"Again for those same possible consequences of driving on this trip with or without the seatbelt fastened that you mentioned earlier, how much would you and anyone else involved really care about those consequences if they actually came about?"*

- **Trip interview coding: 7—Value:**

Specific Possibilities Acknowledged: Significant to the Subject	**Value**		
	Valence (+/-)	**Level (Indiff, Little, Mod, Great Deal, Much As Poss)**	**Indication(s)**
1:			
2:			
3:			
4:			
5:			

Specific Possibilities Acknowledged: Significant to Another Key Party (e.g., Passenger, Family; Specified)	**Value**		
	Valence (+/-)	**Level (Indiff, Little, Mod, Great Deal, Much As Poss)**	**Indication(s)**
1:			
2:			
3:			
4:			
5:			

Issue 8—Tradeoffs: *"I am faced with two (or more) possible actions for this trip. I could either wear my seatbelt or not. Each of these actions has both strengths and weaknesses compared to the other. So if I take one action, I get all its relative advantages but give up all the relative advantages of the other. So, in view of all this, which action should I take?"*

Q8 TRADEOFFS: *"So you were faced with at least two possible seatbelt-related actions for this trip: Wear, not wear, etc. Each of these actions has both strengths and weaknesses compared to the others. So if you take one action, you get all its relative advantages but give up all the relative advantages of the others. What did you see as the strengths and weaknesses of these alternatives?"*

	Action		
	Use Seatbelt	**Not Use Seatbelt**	**Other Specify: _____**
Advantages			
Disadvantages			

How did you think through those relative advantages and disadvantages and then somehow concluded that you should either use your seatbelt, not use it, or something else?

[Might need to ask 'probe' questions, to be able to fill the approach table below]

- **Trip interview coding: 8—Tradeoffs:** *[The analyst codes the subject's indications of the approach he took to dealing with the fact that none of the recognized options—wear seatbelt, don't wear seatbelt, other—dominated its competitors, i.e., was at least as good with respect to every consideration that mattered, per the following table:]*

Approach*	Indication(s)
Dominance Striving	
Noncompensation	
Compensation: Importance Weighting	
Compensation: Other	
Other (Specified)	

***Dominance Striving:** subject seeks to improve one or more of the alternatives to reduce the amount that would have to be sacrificed to pursue it; **Noncompensation:** subject concludes that one set of advantages (disadvantages) are so critical that they cannot be offset by opposing disadvantages (advantages); **Compensation: "Importance" Weighting:** subject feels that the "importance" of the advantages on one side more than offset the importance of those on the other; **Compensation: Other:** subject uses some other scheme whereby an alternative's relative strengths can offset its relative weaknesses.

Issue 9—Acceptability: *"On this trip, I would either use my seatbelt or not. Besides me, who would care one way or the other what I choose to do (and* **how** *I make the choice), and what could and should I do about their opinions?"*

Q9 ACCEPTABILITY: *"On this trip, you knew that you would either use your seatbelt, <u>not</u> use it, (or do something else entirely). Besides you, who else do you feel, at the time, would have cared one way or the other what you chose to do and <u>how</u> you arrived at your choice?"*

What, if anything, did you consider or actually plan to do about how this (these) persons felt?"

- **Trip interview coding: 9—Acceptability:**

Objection Consideration*	Acknowledged (Y/N), and Who Specifically**	How Addressed***	Indication(s)
Who			
Why			
Risk			
Prevention			
Other			

***Who:** who might object to either the subject's decision or how he made it; **Why:** why a particular potential objector might object; **Risk:** how capable and willing the indicated objector could and would seriously harm the intended beneficiaries' interests if displeased ; **Prevention:** measures that could be taken to prevent the consequences of the objector's displeasure if not the his/her objections themselves.

**Whether the subject acknowledged the consideration.

***How the subject addressed the consideration: Who—how the subject sought to identify potential objectors; Why—how the subject sought to determine why the potential objectors might object; Risk—how the subject sought to assess the risk posed by the prospective objections; Prevention—measures the subject took to trying to preclude or deal with the consequences of the prospective objections and how the subject sought to identify or create those measures.

Issue 10—Implementation: *"I'm considering using (not using) my seatbelt on this trip. Is it reasonable to anticipate difficulties actually carrying out that action, if I were to select it? What, if anything, could I do to deal with those difficulties?*

Q10 IMPLEMENTATION: *"When you were considering whether to use your seatbelt, <u>not</u> use your seatbelt (or do something else entirely), what were your thoughts, if any, about whether and how you could actually carry out the action you chose? Please explain."*

- **Trip interview coding: 10—Implementation:**

Option 1: _____		
Anticipated Difficulty*	**How Would Be Addressed****	**Indication(s)**
1:		
2:		
3:		
4:		
5:		

*If nothing is entered, this indicates that no difficulties were acknowledged.

**If nothing is entered, this indicates that no means for addressing the difficulty were brought to mind.

Option 2: _____		
Anticipated Difficulty*	**How Would Be Addressed****	**Indication(s)**
1:		
2:		
3:		
4:		
5:		

*If nothing is entered, this indicates that no difficulties were acknowledged.

**If nothing is entered, this indicates that no means for addressing the difficulty were brought to mind.

Appendix B: Interview Guide 2 – Policy Seatbelt Decisions

Participant _____

POLICY SEATBELT DECISIONS

"Now we are going to talk about your seatbelt use generally rather than in reference to any specific driving occasion such as those we talked about earlier."

Rule Use

Q1: "Do you follow some kind of rule about whether to use a seatbelt when you are driving?"

If subject is silent or unsure how to respond: *"Let me try to put the question a slightly different way with an example: Do you, for instance, have a rule in your head which says something like: 'If so-and-so conditions exist, then I will use my seatbelt; otherwise, I won't.'"*

Yes: Go to Q1a.

No: Go to SERIES "NO"

Q1a: *"I see. Would you explain and elaborate on your seatbelt use rule? Please help me understand how your rule works."*

Q1b: *"Thanks. My next question: How often or consistently would you say that you actually follow your rule? Would you say: 'Almost Never,' 'Occasionally,' 'Usually,', or "Always, Without Fail'?"*

If not 'Always, Without Fail': *"On the occasions when you don't follow your rule, why does that happen? That is, what prevents you from following your rule?"*

Go to **SERIES "YES"**

SERIES "NO"

*"You just said that you don't try to follow any kind of rule about whether to use a seatbelt when you are driving. Have you ever **considered** setting a rule like that?"*

No: Go to **END**

Yes: Continue

"So, I take it that you thought about establishing a rule about using your seatbelt but decided against making such a rule. Right? The purpose of my next series of questions is to understand how you arrived at that decision."

Policy QN0: *"First, in your own words, would you please explain to me how and why you decided that you would **not** establish a rule about when you would and wouldn't use your seatbelt when driving?"*

"Thanks for providing that explanation. You can think of the next set of questions I am going to ask as being very specific follow-ups to that explanation."

Policy Issue 1—Need: *"Is there a threat or opportunity here that should compel me to make a decision about having some kind of rule about whether to use a seatbelt when I'm driving?"*

Policy QN1: *"Please take a moment to reconstruct in your mind when you first started thinking about the possibility of setting up a rule about when you would and wouldn't use your seatbelt. Then let me know when you are ready to tell me about it. (Wait.)*

"So, as best you can, would you please tell me what happened that led you to consider setting up a seatbelt rule for yourself? For instance, did somebody say something? Did you read something? Was there some kind of significant event? Or what?"

Policy Issue 2—Mode: *"Who should I get involved in making this decision? Who is perhaps getting* **themselves** *involved in my making of this decision? What approach should I take in making this decision?: Figure it out from scratch? Follow some rule? Just do what I've always done or simply feel is right? What?"*

Policy QN2a (Mode-Who): *"Again, think back to when you were contemplating a rule to guide your seatbelt use. Were there any other people who got involved in your making that decision?*

Yes: *"Who were those people, what roles did they play (one at a time [assuming more than one])—did they offer suggestions, serve as examples, make the decision for you, or what?*

How, exactly, did each of these people come to be involved?"

No: Continue.

Policy QN2b (Mode-Tools): *"Did certain kinds of 'tools' get involved when you were making your decision to not set up a seatbelt rule for yourself, for instance, information sources, computer programs, decision aids?*

Yes: *"What were those tools, and what roles did they play (one at a time [assuming more than one])—did they offer suggestions, provide examples, make the decision for you, or what?*

How exactly did those tools come to be involved?"

No: Continue.

Policy QN2c (Mode-Primaries): *"When you were thinking about whether to set up a seatbelt rule for yourself, what approach or approaches did you take? Specifically: (a) Did you just try to figure out yourself, from scratch, whether it made sense to make a seatbelt rule to follow? (b) Did you follow some decision-making procedure? Or (c) did you just go with what felt right, perhaps based on things you have done in the past?*

Policy Issue 3—Investment: *"What should I spend—in time, money, aggravation, peace of mind, or anything else—in figuring out whether to have a seatbelt rule for myself?"*

Policy QN3a (What/How Much): *"What did you 'spend' in the process of deciding not to have a seatbelt use rule for yourself? For instance, how much time, energy, peace of mind, or money did you spend doing research, talking to other people, or just thinking about what your rule ought to be?"*

Policy QN3b (How Concluded): *"As best you can recall, how did you conclude that that was the right amount of resources—time, money, energy, peace of mind, etc.—to spend on making your decision about adopting a seatbelt rule?"*

Policy Issue 4—Options: *"What are potentially 'reasonable' things that would make sense for me to consider seriously, in addition to adopting particular seatbelt use rules? How could I go about* **finding** *such potential rules?"*

Policy QN4a (Options): *"Think back to when you were figuring out whether to set up a rule for yourself about whether and when to use your seatbelt. What did you see as all your alternatives, including, for instance, different specific rules and any other specific things you might do instead of having a rule?*

Policy QN4b (Identification/Generation): *"As best you can remember, how did you come up with those alternatives? That is, where or how did you find or invent them?*

Policy Issue 5—Possibilities: *"For any of the particular seatbelt use rules that I could adopt—or alternatives to such rules—what are the various things that could potentially happen as a result? What are good ways to make sure that I actually bring to mind the* **important** *possibilities?"*

Policy QN5a (Recognized)—For each option acknowledged: *"Earlier, you told me that you thought about (several) different alternative actions you might take, including _____ .*

Let's discuss them one at a time. I would like you to tell me this: When you were pondering each of those actions, what were the possible consequences that crossed your mind?"

Policy QN5b (How Surfaced): *"As well as you can, would you please tell me how you went about trying to bring to mind those various potential consequences? In other words, what, if anything, did you do to try to make sure that you didn't miss anything important—especially important things that are not immediately obvious?"*

Policy Issue 6—Judgment: *"It occurs to me that, if I were to adopt rule "X" (or not) one of the possible consequences would be "Y." What are the chances that Y actually* **would** *happen if I were to (not) adopt that rule?" (Similarly for all the possible consequences of the remaining alternatives considered.)*

Policy QN6: *"In the last few minutes, you mentioned a number of things that you thought could happen as a consequence of your decision about whether to adopt a seatbelt use rule, such as _____. Right now, would you please try to bring to mind one of those consequences that figured especially prominently in your thinking and then tell me what it was?* (Wait)

"So (summarizing), it was _____, right?" (Wait for confirmation.)

"Let's focus a bit on _____ (the consequence mentioned), OK? Specifically, tell me how likely you thought it was that _____ would happen if you decided to have a seatbelt rule for yourself as opposed to if you ***didn't*** *have a rule. So, at the time you were thinking about all this, did you think that _____ would have been more likely to happen (a) if you* ***had*** *a seatbelt rule or (b) if you* ***didn't****?* (Wait)

"Good. Now, please tell me ***how much*** *more likely that would have been—either 'Actually equally likely,' 'Only slightly more likely,' 'Moderately more likely,' or 'Much more likely?'* (Wait)

"As best you can explain it, how did you arrive at your judgment that _____ was actually equally likely (only slightly/moderately/much more likely) to happen if you had (didn't have) a seatbelt rule than if you ***didn't (did)****? In other words, how did you come up with your conclusion?"*

"What, if anything, did you do to try to verify the accuracy of your opinion?" (Wait)

"My last question in this section: Just a couple of minutes ago, you told me how you arrived at your judgment about the chances of _____ happening if you did or didn't have a seatbelt use rule for yourself. What are the other kinds of ways that you sometimes arrive at judgments like these when you make decisions?" (Wait)

Policy Issue 7—Value: *"I have envisioned a number of possible consequences of my seatbelt rule options. Those outcomes include the ones I originally sought to achieve or avoid as well as the others that occurred to me later. How much would I and anyone else involved really care about those outcomes if they actually came about?"*

Policy QN7: *"A while ago, you told me about a number of possible consequences of choosing or not choosing to set a rule for yourself about using your seatbelt when driving, including, for instance* _____ (reading from subject's possibilities list). *Remember?* (Wait) *I would like to have us talk a bit about one of them. So would you please pick out one of those consequences that you thought was especially important if not* ***most*** *important?"* (Wait)

"OK. So, let's talk about _____*."* (subject's choice).

"First of all, suppose that _____ *actually did happen. Including you, who are the people you thought would care whether or not that actually happened, that is would be either happy or unhappy about it?"* (Wait and list)

"Now, let's focus on ***you****. At the time you were making your seatbelt rule decision, did you expect that, if* _____ *were to happen, that would make you happy or unhappy?* (Wait)

"Please tell me ***how*** *happy (unhappy) you expected that you would be if* _____ *were to happen—either 'Actually indifferent,' 'A little,' 'Moderately,' 'Very,' or 'Extremely.'* (Wait)

"As well as you can, would you please tell me how you came to your expectation as to how happy (unhappy) you would have been if _____ *were to happen?* (Wait)

"What, if anything, did you do to verify the accuracy of your expectation?" (Wait)

"Now, let's focus on one of the ***other*** *people you just mentioned. Would you please pick one whose feelings would have been especially important to you when making your decision about setting up a seatbelt use rule?"* (Wait) *"The rest of the questions here will concern* _____ *(person selected).*

"At the time you were making your seatbelt rule decision, did you expect that, if _____ *were to happen, that would make* _____ *happy or unhappy?"* (Wait)

"Please tell me ***how*** *happy (unhappy) you expected that* _____ *would be if* _____ *happened—either 'Actually indifferent,' 'A little,' 'Moderately,' 'Very,' or 'Extremely.'* (Wait)

"As well as you can, would you please tell me how you came to your expectation as to how happy (unhappy) _____ *would have been if* _____ *were to happen?* (Wait)

"What, if anything, did you do to verify the accuracy of your expectation?" (Wait)

Policy Issue 8—Tradeoffs: *"I am faced with whether to adopt some seatbelt-use rule and, if so, what particular rule. Each of these alternatives has both strong points and weak points relative to the other things I could do. Therefore, if I pick one, I gain* ***its*** *strengths but sacrifice the strengths of the* ***other*** *alternatives. So, in view of all this, which option should I pick?*

Policy QN8: *"Again, a little while ago, you told me about several potential consequences of choosing or not choosing to set a rule for yourself about using your seatbelt when driving. In my next set of questions, I would like to revisit the things you mentioned.*

"First of all, let's talk about which consequences you saw as either strengths or weaknesses for each alternative, one option at a time. Specifically, I have a little table here that I would like to have us fill out together, putting those consequences into the correct cells." (Fill table, with subject.)

Table format (construct working table, shown to subject, on separate sheet):

Alternative	(Relative) Strengths	(Relative) Weaknesses
No Seatbelt Use Rule		
Some Kind of Rule		
Rule 1		
Rule 2		

"As we can easily see, each of the actions you could have taken concerning setting up a seatbelt use rule for yourself had different strengths and weaknesses relative to the other actions, right?" (Pause) *So, if you pursued one action you would benefit from its relative strengths, but you would have to put up with its weaknesses, too, and therefore you had a dilemma on your hands. See what I mean?* (Wait) *So my question: As best you can, would you please explain to me how you resolved the dilemma as you saw it at the time you were actually making your decision?* (Wait)

Policy Issue 9—Acceptability: *"I'm faced with deciding whether to set a seatbelt use rule for myself and, if so, what rule. Who would care if I choose to go one way or another, and about how I arrive at my choice? What, if anything, could and should I do about those people's opinions?*

Policy QN9: *"Think back to when you were trying to figure out what you should do in terms of setting up a seatbelt use rule that you might follow.*

*"Who were the people, if any, who you thought would care—one way or the other—what you decided, and perhaps **how** you reached your decision?"* (Wait and list.)

"Would you please pick out one of those people whose opinions you considered to be especially important from your point of view?" (Wait and note.)

"So, let's talk about _____ (person chosen). At the time you were pondering your decision, why did you think that _____ would care about what you eventually chose to do?" (Wait.)

*"Irrespective of **what** you eventually chose to do, at the time, did you think that _____ cared about **how** you reached your decision? Please explain."* (Wait.)

"As best you can recall, would you please tell me what, if anything, you did to deal with _____'s possible feelings? Put another way, how, if at all, did you take _____'s opinions into account when you made your decision? Also, would you please explain why you took that particular approach?"

Policy Issue 10—Implementation: *"I am considering whether to set a seatbelt use rule for myself, and if so, what that rule might be. Is it reasonable to anticipate that I would experience certain difficulties actually carrying out the action that I am contemplating? What might those difficulties be? What, if anything, could I do to deal with those difficulties? How, if at all, should these potential difficulties affect the decision I make?"*

Policy QN10: *"Think back to when you were trying to decide whether or not to adopt a seatbelt use rule and, if so, what such a rule might look like. When you were doing that, what potential difficulties, if any, did you envision experiencing when trying to put each the rule into effect, when actually* ***applying*** *that rule?"* (Wait)

"How about possible difficulties in acting on a decision to ***not*** *have a rule at all?* (Wait)

"What, if anything, did you anticipate that you could do in order to deal with each of the difficulties you envisioned?" (Wait)

"How, if at all, did these anticipated difficulties affect how you went about making your final decision?" (Wait)

Go to **END**.

SERIES "YES"

The purpose of my next series of questions is to understand how you arrived at your decision to employ a rule to determine when you do or don't use your seatbelt while driving."

Policy QY0: *"First, in your own words, would you please explain to me how and why you decided that you **would** establish a rule about when you would and wouldn't use your seatbelt when driving?"*

"Thanks for providing that explanation. You can think of the next set of questions I am going to ask as being very specific follow-ups to that explanation."

Policy Issue 1—Need: *"Is there a threat or opportunity here that should compel me to make a decision about having some kind of rule about whether to use a seatbelt when I'm driving?"*

Policy QY1: *"Please take a moment to reconstruct in your mind when you first started thinking about the possibility of setting up a rule about when you would and wouldn't use your seatbelt. Then let me know when you are ready to tell me about it. (Wait.)*

"So, as best you can, would you please tell me what happened that led you to consider setting up a seatbelt rule for yourself? For instance, did somebody say something? Did you read something? Was there some kind of significant event, or what?"

Policy Issue 2—Mode: *"Who should I get involved in making this decision? Who is perhaps getting* **themselves** *involved in my making of this decision? What approach should I take in making this decision?: Figure it out from scratch? Follow some rule? Just do what I've always done or simply feel is right? What?"*

Policy QY2a (Mode-Who): *"Again, think back to when you were contemplating a rule to guide your seatbelt use. Were there any other people who got involved in your making that decision?*

Yes: *"Who were those people, what roles did they play (one at a time [assuming more than one])—did they offer suggestions, serve as examples, make the decision for you, or what?*

How, exactly, did each of these people come to be involved?"

No: Continue.

Policy QY2b (Mode-Tools): *"Did certain kinds of 'tools' get involved when you were making your decision to set up a seatbelt rule for yourself, for instance, information sources, computer programs, decision aids?*

Yes: *"What were those tools, and what roles did they play (one at a time [assuming more than one])—did they offer suggestions, provide examples, make the decision for you, or what?*

How, exactly, did each of these tools come to be involved?"

No: Continue.

Policy QY2c (Mode-Primaries): *"When you were thinking about whether to set up a seatbelt rule for yourself, what approach or approaches did you take? Specifically: (a) Did you just try to figure out yourself, from scratch, whether it made sense to make a seatbelt rule to follow? (b) Did you follow some decision-making procedure? Or (c) did you just go with what felt right, perhaps based on things you have done in the past?*

Policy Issue 3—Investment: *"What should I spend—in time, money, aggravation, or anything else—in figuring out whether to have a seatbelt rule for myself?"*

Policy QY3a (What/How Much): *"What did you 'spend' in the process of deciding to have a seatbelt use rule for yourself? For instance, how much time, energy, peace of mind, or money did you spend doing research, talking to other people, or just thinking about what your rule ought to be?"*

Policy QY3b (How Concluded): *"As best you can recall, how did you conclude that that was the right amount of resources—time, money, energy, peace of mind, etc.—to spend on making your decision about adopting a seatbelt rule?"*

Policy Issue 4—Options: *"What are potentially 'reasonable' things that would make sense for me to consider seriously, in addition to adopting particular seatbelt use rules? How could I go about* **finding** *such potential rules?"*

Policy QY4a (Options): *"Think back to when you were figuring out whether to set up a rule for yourself about whether and when to use your seatbelt. What did you see as all your alternatives, including, for instance, different specific rules and any other specific things you might do instead of having a rule?*

Policy QY4b (Identification/Generation): *"As best you can remember, how did you come up with those alternatives? That is, where or how did you find or invent them?*

Policy Issue 5—Possibilities: *"For any of the particular seatbelt use rules that I could adopt—or alternatives to such rules—what are the various things that could potentially happen as a result? What are good ways to make sure that I actually bring to mind the* **important** *possibilities?"*

Policy QY5a (Recognized)—For each option acknowledged: *"Earlier, you told me that you thought about (several) different alternative actions you might take, including _____ . Let's discuss them one at a time. I would like you to tell me this: When you were pondering each of those actions, what were the possible consequences that crossed your mind?"*

Policy QY5b (How Surfaced): *"As well as you can, would you please tell me how you went about trying to bring to mind those various potential consequences? In other words, what, if anything, did you do to try to make sure that you didn't miss anything important—especially important things that are not immediately obvious?"*

Policy Issue 6—Judgment: *"It occurs to me that, if I were to adopt rule "X" (or not) one of the possible consequences would be "Y." What are the chances that Y actually* **would** *happen if I were to (not) adopt that rule?" (Similarly for all the possible consequences of the remaining alternatives considered.)*

Policy QY6: *"In the last few minutes, you mentioned a number of things that you thought could happen that as a consequence of your decision about whether to adopt a seatbelt use rule, such as _____. Right now, would you please try to bring to mind one of those consequences that figured especially prominently in your thinking and then tell me what it was?* (Wait)

"So (summarizing), it was _____, right?" (Wait for confirmation.)

"Let's focus a bit on _____ (the consequence mentioned), OK? Specifically, tell me how likely you thought it was that _____ would happen if you decided to have a seatbelt rule for yourself as opposed to if you ***didn't*** *have a rule. So, at the time you were thinking about all this, did you think that _____ would have been more likely to happen (a) if you* ***had*** *a seatbelt rule or (b) if you* ***didn't****?* (Wait)

"Good. Now, please tell me ***how much*** *more likely that would have been—either 'Actually equally likely,' 'Only slightly more likely,' 'Moderately more likely,' or 'Much more likely?'* (Wait)

"As best you can explain it, how did you arrive at your judgment that _____ was actually equally likely (only slightly/moderately/much more likely) to happen if you had (didn't have) a seatbelt rule than if you ***didn't (did)****? In other words, how did you come up with your conclusion?"*

"What, if anything, did you do to try to verify the accuracy of your opinion?" (Wait)

"My last question in this section: Just a couple of minutes ago, you told me how you arrived at your judgment about the chances of _____ happening if you did or didn't have a seatbelt use rule for yourself. What are the other kinds of ways that you sometimes arrive at judgments like these when you make decisions?" (Wait)

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Policy QY7: *"A while ago, you told me about a number of possible consequences of choosing or not choosing to set a rule for yourself about using your seatbelt when driving, including, for instance _____* (reading from subject's possibilities list). *Remember?* (Wait) *I would like to have us talk a bit about one of them. So would you please pick out one of those consequences that you thought was especially important if not* ***most*** *important?"* (Wait)

"OK. So, let's talk about _____." (subject's choice).

"First of all, suppose that _____ actually did happen. Including you, who are the people you thought would care whether or not that actually happened, that is would be either happy or unhappy about it?" (Wait and list)

*"Now, let's focus on **you**. At the time you were making your seatbelt rule decision, did you expect that, if _____ were to happen, that would make you happy or unhappy?* (Wait)

*"Please tell me **how** happy (unhappy) you expected that you would be if _____ were to happen—either 'Actually indifferent,' 'A little,' 'Moderately,' 'Very,' or 'Extremely.'* (Wait)

"As well as you can, would you please tell me how you came to your expectation as to how happy (unhappy) you would have been if _____ were to happen? (Wait)

"What, if anything, did you do to verify the accuracy of your expectation?" (Wait)

*"Now, let's focus on one of the **other** people you just mentioned. Would you please pick one whose feelings would have been especially important to you when making your decision about setting up a seatbelt use rule?"* (Wait) *"The rest of the questions here will concern _____ (person selected).*

"At the time you were making your seatbelt rule decision, did you expect that, if _____ were to happen, that would make _____ happy or unhappy?" (Wait)

*"Please tell me **how** happy (unhappy) you expected that _____ would be if _____ happened—either 'Actually indifferent,' 'A little,' 'Moderately,' 'Very,' or 'Extremely.'* (Wait)

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Policy QY9: *"Think back to when you were trying to figure out what you should do in terms of setting up a seatbelt use rule that you might follow.*

*"Who were the people, if any, who you thought would care—one way or the other—what you decided, and perhaps **how** you reached your decision?"* (Wait and list.)

"Would you please pick out one of those people whose opinions you considered to be especially important from your point of view?" (Wait and note.)

"So, let's talk about _____ (person chosen). At the time you were pondering your decision, why did you think that _____ would care about what you eventually chose to do?" (Wait.)

*"Irrespective of **what** you eventually chose to do, at the time, did you think that _____ cared about **how** you reached your decision? Please explain."* (Wait.)

"As best you can recall, would you please tell me what, if anything, you did to deal with _____'s possible feelings? Put another way, how, if at all, did you take _____'s opinions into account when you made your decision? Also, would you please explain why you took that particular approach?"

Policy Issue 10—Implementation: *"I am considering whether to set a seatbelt use rule for myself, and if so, what that rule might be. Is it reasonable to anticipate that I would experience certain difficulties actually carrying out the action that I am contemplating? What might those difficulties be? What, if anything, could I do to deal with those difficulties? How, if at all, should these potential difficulties affect the decision I make?"*

Policy QY10: *"Think back to when you were trying to decide whether or not to adopt a seatbelt use rule and, if so, what such a rule might look like. When you were doing that, what potential difficulties, if any, did you envision experiencing when trying to put each the rule into effect, when actually* ***applying*** *that rule?"* (Wait)

"How about possible difficulties in acting on a decision to ***not*** *have a rule at all?* (Wait)

"What, if anything, did you anticipate that you could do in order to deal with each of the difficulties you envisioned?" (Wait)

"How, if at all, did these anticipated difficulties affect how you went about making your final decision?" (Wait)

Go to **END**.

END

"That was my last question. We're done! Thank you so much for helping us out in our study."